Financial Accounting for the Shipping Industry

Negkakis, Ioannis

Award date:
2021

Awarding institution:
University of Bath

Financial Accounting for the Shipping Industry

Negkakis, Ioannis

Award date:
2021

Awarding institution:
University of Bath

Financial Accounting for the Shipping Industry

Ioannis C. Negkakis

Thesis submitted to the University of Bath

For the Degree of Doctor of Philosophy

University of Bath

School of Management

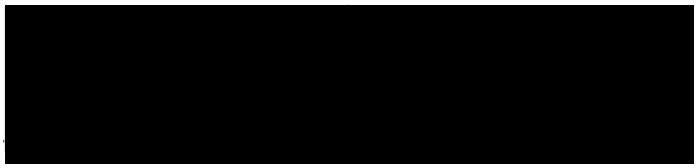
JUNE 2020

Dedicated

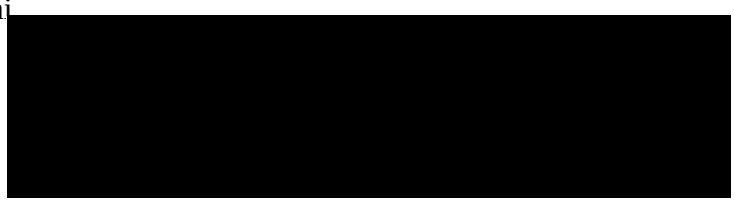
To My Family

Declaration of any previous submission of the work

The material presented here for examination for the award of a higher degree by research has not been incorporated into a submission for another degree.

Candidate's signature …  …….

Declaration of authorship

I am the author of thi  out by myself personally

Candidate's signature ……..

Table of Contents

Tables

Acknowledgments

First and foremost, I would like to thank from the bottom of my heart my Supervisor Professor Dimitrios Gounopoulos for the constant support and critical suggestions and comments on the thesis. He has always been there as a Mentor, assisting me in my efforts to continuously improve as a person and a researcher. In addition, I would like to thank my co-supervisor Professor David Newton for his guidance and support throughout the whole process.

Moreover, I would also like to thank the Internal examiner, Dr. Fanis Tsoligkas, and External Examiner, Professor Neophytos Lambertides, for their time and consideration as well as for helpful comments and suggestions. Their insightful views helped me improve my work.

Furthermore, I would like to thank Ass. Professor Anestis Ladas for his support, friendship, and help. In addition, the thesis has benefited greatly from the insightful comments and suggestions provided by Professor Andreas Merikas, Professor Anna Merika, Professor Panagiotis Tachinakis, Ass. Professor Panagiotis Tziogkidis and Dr. Viktoria Patsika.

Finally, I would like to thank my family for always being there, supporting and believing in me, under any circumstances. I hope that I make them as proud and happy as they make me every day.

Abstract

This thesis focuses on financial accounting for the shipping industry. The research motivation stems from the need to control information asymmetry in a sector with high external finance needs. In this respect, since information asymmetry can negatively affect the funds of a shipping firm, which are needed to operate efficiently and invest in new vessels, the current thesis aims to analyze the accounting and auditing procedures of these firms. The first chapter covers the thesis introduction, which develops the research motivation, as well as a summary of the main results of each chapter. The second chapter examines the differences in the accounting and auditing procedures as well as the developments in the fintech sector that are useful and are expected to affect the shipping industry. The second chapter's contribution regards the need to develop special accounting and auditing procedures to accommodate the special needs of the shipping industry compared to other sectors of the economy. The third chapter focuses on special accounting issues that have an impact on information asymmetry and the financial statements of a shipping firm. The results of this chapter show that bigger maritime firms have a higher quality of earnings through less positive discretionary accruals. This finding is likely related to the high needs of larger shipping firms for funding, which in turn increases the need for high-quality financial statements. Moreover, the operating performance of maritime firms that are incorporated in countries where the accounting standards have converged to the IFRS is positively related to earnings quality, while the fraction of the tangible assets of a shipping firm compared to the total assets is negatively related to discretionary accruals. This chapter contributes to the literature by providing evidence of the attempt of shipping firms to increase the quality of the accounting information, to decrease information asymmetry, through the decrease in discretionary accruals, as well as the factors that affect this procedure. The fourth chapter examines the effects on information asymmetry and earnings quality conditional on the choice of the country of incorporation. The chapter's results underline the likely existence of a relation between earnings quality and the decision of a shipping firm to base its operation in an OFC due to the existence of a flexible regulation environment, financial secrecy and low tax rates. The chapter contributes by showing that simply fixating on one of the three above characteristics of an OFC won't help in uncovering

the determinants of earnings quality. On the contrary, a combination of those characteristics may help in explaining changes in the level of earnings management and, in turn, information asymmetry. The fifth chapter concludes the thesis, describes the limitations, and offers implications for future research.

CHAPTER 1

Introduction

1.1 Background and Motivation

The shipping sector constitutes on of the most important sectors of the global economy (Panayides et al., 2013; Alexandridis et al., 2018) as it is responsible for 80%-90% of world trade (UNCTAD, 2018) and affects the well-being of other industries because it is a critical part of the transfer of goods global infrastructure. Moreover, this sector is characterized by assets of high value and complexity, namely ships, which travel across the globe and are subject to significant risks (Alexandridis et al, 2017) while the shipping firms may be incorporated in countries characterized as Offshore Financial Centers (OFCs). Maritime firms need high financial support to maintain the fleets at an operational level and obtain new ships. In addition, they present higher cash holdings in comparison to other asset-heavy industries (Ahrends et al, 2018). Moreover, investors and lenders of shipping firms require credible and highly informative financial statements to make investment and lending decisions. However, shipping firms may face several problems to attract funding and maintain operations. Specifically, information asymmetry may arise due to shipping firms being domiciled in OFCs, while the high-value assets may create additional complexities for their accounting treatment. Lastly, the high-risk exposure of these firms may ask for advanced auditing procedures. Despite the prominence of the shipping sector and its high value and significance for the global economy, there has not been much attention on the accounting and auditing issues raised in these firms, which are distinct from the relative procedures followed by firms of other sectors. The present thesis examines the accounting and auditing aspects of the shipping sector.

Specifically, due to the high value of assets like ships, the firms of the related industry may face a number of issues regarding their accounting treatment. Among these issues are the leases and impairments. First, as regards leases, shipping firms use

or provide chartering services to maintain high operational levels and cope with the high demand for transfer services. In this respect, leases constitute a significant section of the accounting procedures within a shipping firm. Moreover, impairments may also affect the financial statements of a shipping firm. Due to the high value of the ships and the global operations, they have as well as the risky conditions in which they operate (i.e. open seas with a high probability of storms), the firm always faces the risk of diminishing ship value. In such a case, the firm will have to examine the asset for an impairment in order to assess whether its recoverable amount is lower than the book value and if in this condition, it recognizes an impairment. Given the high value of the asset under the impairment procedure (ship) the recognition of an impairment may have important and negative effects for the income statement.

Another important aspect is the country in which a shipping firm may base its headquarters. Given the global nature as well as the special provisions of the regulatory environment of the shipping sector, firms in this sector may choose to be domiciled in countries that offer the ideal conditions for them. The characteristics offered by such countries to draw foreign capital may range from low tax rates and lax regulations to high financial secrecy and combinations thereof. Thus, shipping companies face a critical decision regarding the country to be domiciled. Nevertheless, this decision may have an impact on information asymmetry. Given that shipping firms are highly leveraged firms with high funding needs, an increase in information asymmetry will not help the funding procedure, either from the capital or the debt markets, but will reduce the investment interest in these firms.

Thus, the motivation of this thesis stems from the central position that the shipping industry has among other industries in the global economy in terms of capitalization and total revenues (i.e. Parviainen et al., 2018) and the contemporaneous need for low information asymmetry to fund acquisitions of new assets and maintain operations globally. The key to understanding how information asymmetry affects shipping firms are the accounting and auditing procedures. Therefore, decisions relating to accounting and auditing, like the decision of a shipping firm to being domiciled in an OFC for tax purposes, will have a direct impact on information asymmetry and agency costs. The shipping crisis of the period 2008-2010, which was fueled by the Global Financial Crisis of 2007-2009, placed

additional burdens on the funding procedure, leading to a turn in the funding methods for shipping firms from bank lending to raising funds from the capital markets. In turn, the decrease in information asymmetry became even more important in order to attract new investors from the stock markets.

Through the examination of the accounting and auditing procedures, this thesis attempts to examine the conditions under which the information asymmetry may decrease by centering its research methodology in three dimensions, which form the main chapters of the thesis and relate to information asymmetry in the shipping firms. The first regards the distinct features that the accounting and auditing procedure may have for shipping firms, along with special issues like the use of cryptocurrencies as means of payment and the blockchain and big data analytics technologies. The second relates to accounting standards and the financial statements of shipping firms in relation to the information asymmetry effects they may have from specific accounting procedures. These procedures concern impairments and leases as well as any attempts to manage earnings. The aim of this investigation is to examine if the performance of the shipping firms is affected by these three factors and under which conditions information asymmetry is decreased. The last has to do with the choice of the country of incorporation and the effects of this choice on information asymmetry through earnings management. Each of the subjects, along with the methodology, the main findings and the contribution to the literature, are described in the next sub-sections of this chapter.

1.2 Shipping Industry Financial Accounting and Auditing

Given the important role of accounting and auditing in curtailing information asymmetry and the high need for shipping firms to reduce information asymmetry in order to attract funding for their high needs, the second chapter of the thesis examines the differences in the accounting and auditing procedure of firms in the shipping sector in relation to other sectors of the economy. In turn, the critical differences between the shipping sector and the rest of the sectors in the economy call for special attention to the accounting and the auditing procedure of these firms. The second

chapter attempts to analyze the accounting treatment of special items for shipping firms relating to chartering and proposes an appropriate accounting treatment.

The methodology of the chapter is based on the analysis of cases approach, whereby it develops the case relating to special accounting items and then provides the accounting entries. These may include the accounting treatment of various revenues and expenses that are incurred through a journey of a ship as well as chartering services. Moreover, the second chapter analyzes the special characteristics of the auditing procedure of firms in the shipping sector. Given the high-risk exposure of shipping firms, due to global operations at sea, the operation of a reliable internal control system is crucial for shipping firms.

The last part of the chapter aims to analyze the use of cryptocurrencies and blockchain technology in the sector. It presents the main characteristics of the cryptocurrencies and the steps that should be taken in order to hedge against the risk of their use in order to take advantage of their advantages (low or zero transaction fees and near-zero time of transaction). Moreover, the chapter analyzes the main characteristics of blockchain technology and supports the future use of this highly prospective technology for the shipping sector.

The contribution of the second chapter regards the need to develop special accounting and auditing procedures to accommodate the specifics of the shipping industry in relation to other sectors of the economy. The differentiating characteristics of the shipping industry include, among others, the use of high-value assets that do not have a fixed location as well as the need for an excessive risk management procedure due to the global operations and risks that are related to operating a ship. In turn, the chapter contributes to the literature in three ways. First, it develops a number of cases that present and analyze the appropriate accounting treatment of the complex matters faced by a shipping firm related to charter-parties and the use of a ship. Second, it expands on the auditing procedures used by the shipping firms to manage the excessive risk exposure stemming from global operations, which may include, among others, terrorist activities, foreign exchange risk and great exposure to economic downturns. Third, it provides a number of tools based on fintech. These tools are analyzed with respect to their adoption by the shipping industry and mainly

relate to cryptocurrencies (as means of payments) and the blockchain technology and big data analytics. Moreover, the analysis expands on the appropriate conditions for the adoption of cryptocurrencies and blockchain.

1.3 Accounting Standards and the Financial Statements of Maritime Companies

As argued thus far in this chapter, the decrease in information asymmetry is important for the shipping firms and can be controlled through the accounting procedures. Moreover, the shipping firms may face problems relating to the decision to lease ships or the recognition of impairments. Both of these decisions may have an impact along with any attempt to manage earnings in information asymmetry and the reliability of financial statements. The second chapter relates to the effects of accounting standards and their implementation in the financial statements of maritime firms. The methodological analysis is based on three distinct factors: asset impairments, operating leases and the existence of discretionary accruals that lead to earnings management. The reasoning behind choosing these specific factors is based on the premise that, as analyzed above, maritime firms have unique characteristics in relation to other industries. Among these characteristics are high corporate cash holdings, high tangibility ratios, high leverage (Drobetz et al., 2013; Ahrends et al., 2018) and global operations.

In turn, the high tangibility ratios (high value fixed assets in relation to other assets of the shipping firm) may trigger impairments and lead to large losses recorded in the financial statements. On the other hand, operating leases are an important procedure for shipping firms due to the high need to fund new ships, which may lead the firm to lease this kind of equipment. The third factor is earnings management, which leads to high information asymmetry and low financial reporting quality.

The methodological part of the third chapter aims to uncover any effects of the accounting standards on earnings management, the determinants of impairment recognition as well as their likely use as tools of earnings management. Lastly, the chapter examines the effects of the decision to lease equipment on operating performance as well as any effects of the crisis on the information content of leases

for firm performance. For this, the chapter uses two samples drawn from Compustat Global and regarding firms from a large number of countries. Due to the limitations of this sampling regarding impairments, we use an additional sample from Compustat North America to examine the information content of impairments.

The main results of the chapter, using a sample of firms domiciled in countries from all over the world, show that bigger maritime firms have a higher quality of earnings through less positive discretionary accruals, and this may be attributed to the higher financing needs of these firms. Moreover, the higher the performance of the maritime firms that are incorporated in countries where the accounting standards have converged to the IFRS, the higher their earnings quality. On the other hand, the tangibility ratios of shipping firms are negatively related to positive or negative discretionary accruals. In sum, the above results suggest that the shipping firm characteristics seem to relate with various proxies of discretionary accruals, and this is in agreement with the two related research hypotheses of the chapter.

The examination of the sample of US firms shows that larger shipping firms disclose negative news about their long-lived assets (recognize impairments) at a higher rate than smaller shipping firms. Further analysis indicates that impairments are related to some extent to negative discretionary accruals for shipping firms. These results support the argument that the high degree of tangible assets that shipping firms have may lead to a higher likelihood of the discretionary use of asset impairments. The last part of the results show that the proxy of capitalized leases is positively related to firm performance, and this effect is even more positive during the shipping crisis of 2008-2010.

Regarding the contribution of the empirical analysis of the chapter, it should be useful for academics, regulators and practitioners. The reason is that it provides evidence on the distinctive characteristics that shipping firms have as well as the effects that these characteristics have on performance and earnings quality. The results underline the importance of the accounting standards implementation and the accounting procedures followed in the shipping industry on information asymmetry. Given that decreasing information asymmetry is a crucial condition in attracting funding and the high needs of the shipping sectors for funds to maintain operations

and the shipping fleet, the analysis of the chapter should be useful in identifying the conditions under which information asymmetry decreases and the quality of information in the financial statements of a shipping firm increases.

1.4 Offshore Financial Centers, Earnings Management and Maritime Companies

Shipping firms operate globally and under strict maritime rules and laws. In this respect, shipping firms may choose to be domiciled to specific counties offering lax regulations, low tax rates and high financial secrecy or combinations of these characteristics. However, this choice may also have an impact on information asymmetry, with all the negative related effects in attracting new funding. In turn, the fourth chapter examines the effects of the choice of country of incorporation on the level of the financial reporting quality of shipping firms. The aim is to examine if the choice to be incorporated in an OFC affects information asymmetry due to the earnings management of a shipping firm. Shipping firms are among the firms expected to be incorporated in such jurisdictions due to their distinctive characteristics analyzed above. Desai et al. (2006) argue that firms that are large in size, are characterized by high growth, and that have a high proportion of international activities, among other characteristics, have a higher likelihood of incorporation in tax havens.

The research methodology is based on regression models with earnings management proxies as the main dependent variables and a number of independent variables acting as proxies of low tax rates, lax financial regulations and financial secrecy. Moreover, the models also include various variables. The research methodology builds on previous studies that have reported that these three characteristics of OFCs may have independent as well as combined effects on a shipping firm's financial reporting quality (i.e. Durnev et al., 2016, 2017). In turn, the regression models of this chapter attempt to disentangle these effects using a number of dummy variables along with their cross-sections.

The main results of the chapter show that the decision of a shipping firm to base its operations in an OFC due to the existence of the three characteristics (flexible

regulation environment, financial secrecy and low tax rates) may be related to earnings quality. More important, however, is the finding of a relationship between combinations of these characteristics (when two or more of these characteristics are present) and earnings quality, which implies that simply fixating on one of those characteristics, like low tax rates, cannot reveal the full picture on the factors of an OFC that decrease information asymmetry. Put differently, there is significant explanatory power in the cross-section of these characteristics. A number of robustness checks do not alter the main conclusions. Thus, the results of this chapter imply that the choice of the country of incorporation for a shipping firm may have distinctive effects on its earnings quality.

The contribution of this chapter relates to the analysis above, showing that simply fixating on individual OFC characteristics like the tax-haven status may not help in uncovering the full information set of OFCs in relation to earnings management and information asymmetry. On the contrary, certain combinations of the three OFC characteristics have incremental information content for financial reporting quality. To this end, the analysis of the fourth chapter reveals the conditions under which information asymmetry may decrease for a shipping firm, which is deemed important due to the effects of information asymmetry on attracting capital and new funding. Thus, the results of this chapter should be useful to regulators, academic and practitioners.

1.5 Structure of the Thesis

The rest of the thesis is organized as follows: Chapter 2 explains the differences in the accounting and auditing procedure of a shipping firm as well as new developments in the fintech sector that may be useful for the shipping industry. Chapter 3 examines special accounting issues that have an impact on information asymmetry and the financial statements of a shipping firm, and Chapter 4 looks at the effects of the choice of the country of incorporation on information asymmetry and earnings quality. Last, Chapter 5 concludes the thesis and develops its limitations as well as the proposals for future research.

CHAPTER 2
Shipping Industry Financial Accounting and Auditing

2.1 Introduction

As argued in the first chapter, shipping firms are in need of a reliable accounting and auditing system that will enable them to reduce information asymmetry and attract further funds in order to maintain their operations and their fleet. However, a number of problems arise in relation to the distinct nature of the shipping sector compared to the other sectors. First, the accounting procedure in the shipping companies is sub-structured on each ship. In this respect, ships are independent cash-generating units and their captains usually do the bookkeeping during the journey. This creates the need for specially designed accounting procedures that will help the shipping firm to efficiently manage the inflow of accounting information and accordingly record it in the accounting books.

A second aspect relating to the global operations of a shipping company is the auditing procedure. Due to the way that a ship travels across the globe, through adverse weather conditions and rough seas, the risks related to its operations are higher than the risks faced by an industrial firm. In this respect, a firm may be subject to terrorist attacks, wind, open oceans and harmful health conditions in places affected by adverse health concerns. For these reasons, the operations of an efficient internal auditing system are of great importance in order to ensure the well-being of the shipping firms.

The present chapter examines the accounting and auditing procedures, specifically for the shipping sector, and the characteristics that make this industry different from other industries. The chapter focuses on the differences in the accounting and auditing procedures of shipping firms compared to firms of other industries. In this respect, we analyze the accounting treatment of expenses and

revenues stemming from shipping operations and shipping contracts. Specifically, the chapter develops the accounting treatment for the recognition and analysis of the tonnage charter-parties, the time-based charter-parties and the Contract of Affreightments (Bills of Lading). The analysis of the chapter is useful in order to understand the differences between shipping accounting and other branches of accounting as well as how the shipping firm may increase the quality of their accounting information and, in turn, reduce information asymmetry.

Moreover, we analyze the auditing procedures in relation to the internal and external audits of shipping firms. The relevant sub-section starts with the development of an efficient internal auditing system for shipping firms as well as the procedures of external auditing for such firms. We also set the current problems related to the accounting and auditing procedures and attempt to provide solutions based on current advances in the fintech area.

In this respect, the last part of the chapter is devoted to the effects of financial technology and specifically the use of cryptocurrencies as a means of payment and the development of blockchain-based applications for the shipping industry. The research motivation is based on the current problems of the transfer of funds faced by the shipping firms, which include among others the foreign exchange risk and the time and cost to move money from country to country in order to pay for shipping services. Another problem that emerges is the high data-handling costs for shipping firms generated from the data management of everyday business activities. Therefore, based on current technology changes in terms of cryptocurrencies, we propose approaches based on the use of cryptocurrencies as a means of digital payment as well as the development of blockchain applications and big data for the handling of the information generated by shipping firms.

The contribution of this chapter relates to the special aspects of the shipping firms in relation to accounting and auditing procedures. In this respect, the shipping firms have high-value assets which are not based on fixed locations but travel across the globe. Another aspect of shipping firms is the provision or use of chartering services. Therefore, there is a need for special accounting practices in order to record revenues and expenses throughout the journey of a ship or in order to provide the

correct accounting treatment of charter-parties. The chapter contributes to the literature in three ways. First, it develops a number of cases to explain the appropriate accounting treatment of charter-parties and the use of a ship in order to underline the important differences between the shipping sector and other sectors of the economy. Second, it expands on the auditing procedures used by the shipping firms to control risk exposure. Due to the global operations of the shipping firms, risks are higher in relation to other industries and include among others, terrorist activities, foreign exchange risk and great exposure to economic downturns. Third, it provides a number of tools based on financial technology (fintech) and mainly related to the uses of cryptocurrencies as a means of payment and blockchain technology as a way of storing, assessing and distributing large amounts of information.

The rest of the chapter is organized as follows: Section 2.2 describes the special aspects of the shipping firms in terms of the accounting procedure and develops the accounting treatment for them. Section 2.3 develops the auditing procedure in terms of internal and external auditing for shipping firms, and Section 2.4 describes the use of financial technology (cryptocurrencies and blockchain) for shipping firms. Lastly, Section 2.5 concludes the chapter and offers implications for future research.

2.2 Financial Accounting Aspects of the Shipping Industry

As argued above, the shipping sector is a dynamic and changing sector with a volatile environment (Merikas et al., 2009; Alexandrou et al., 2014; Drobetz et al., 2017). Moreover, when it comes to maritime firms, financial and cost accounting are part of shipping economics, and especially the area of shipping industry microeconomics. Financial accounting is the backbone of every industry and company. The shipping industry, however, due to the unique aspects and characteristics that it exhibits, needs special care in the sense that ships are viewed as large cash-generating units that operate globally (Protopsaltis, 2008).

Even though at first sight there are no great differences between the shipping industry and any other industry, when it comes to bookkeeping, those differences and

difficulties become more visible in relation to certain transactions that affect the shipping industry as a whole. Therefore, financial accounting for shipping firms may diverge in relation to other industries and this is due to the specific difficulties that must be faced by firms of this industry. An example of those special characteristics for the financial accounting for maritime companies is the definition, tracking and control for the financial state of a shipping firm, the estimation of maritime costs, and the accounting treatment of revenues and expenses accounts, which are unique in this industry (Protopsaltis and Sarikostidis, 2003). Moreover, shipping firms may take various legal forms (see Negkakis, 2016).

Accounting systems regard the formal description of the accounting procedure followed within a firm (Needles et al., 2013, see also Ghicas et al., 2016). As regards shipping companies, the most commonly used accounting system is the double-entry bookkeeping system. However, as argued above, and despite the fact that shipping firms follow the same accounting rules as other firms, the accounts that are widely used by shipping firms may differ from the accounting used by other firms.

One of the main asset accounts of a shipping firm is the account in which it recognizes its ships. This account (Ships) represents the net value of its ships. The balance of this account may represent a large fraction of the total assets of a shipping firm in relation to other fixed assets. In this respect, and bearing in mind that these assets (ships) may travel globally, the main assets of shipping firms are not based in a fixed position but move globally. This creates a number of risks for these assets.

The Charterers and Shippers accounts are also important for shipping firms. In the former, it recognizes an asset consisting of the amount owed by the charterers to the shipping firm (account receivables). In the latter (Shippers), a shipping firm may recognize the liability relating to amounts owed to ship owners based on a charter-party. In the same group of accounts, the special accounts for shipping Agencies, Brokers and Master's Account (the special account for the Ship's Captain) are included.

In addition to the accounts mentioned above, crucial accounts for the accounting treatment of the shipping industry regarding ships' Expenses Accounts are

the Suppliers, i.e. the Ship chandlers, Maintenance and repairs, Crew compensations and costs, Repairers and Shipyards, Port dues and Taxes, Protection and Indemnity clubs, and Annual and Special survey accounts. Moreover, a special and important account for shipping firms regarding Inventory Accounts is the Bunkering (fuel) and lubricants account. Due to the immense costs deriving from the ship travelling all over the world, these accounts may hold significant amounts and be a large fraction of the inventory of the shipping firm. Accounts that are specific for the shipping industry are the following: Shipbrokers-Brokers, Insurance brokers and Underwriters, which belong to the Short-term liabilities group of accounts. Moreover, there is the Profit Accounts from the Leases-Chartering-Bill of Ladings, which is also an account unique in the shipping industry and is included in the Revenues group of accounts. Those are some of the main accounts specially used by shipping firms and the shipping industry due to their unique nature and characteristics (Protopsaltis, 2008).

Finally, due to the international character of the shipping industry and its global operations, there is a vast use of foreign currency. International firms must face the problem of using foreign currency and manage the foreign exchange risk (Lewis and Pendrill, 2000). The accounts that are mainly presented in foreign currency are those relating to receivables and liabilities, accounts concerning banking as well as loan liabilities and deposits and the master's account and cash accounts.

Ships are used for a wide range of purposes, and the most interesting of these from an accounting perspective is the commercial use of a ship to transfer goods and people. The handling of the income accounts requires special treatment due to operational uniqueness of the shipping industry. Financially speaking, the trade of goods and transport of people is the greatest source of income for the shipping industry and is primarily governed through the charter contracts, which are mainly grouped into four categories (Plomaritou and Papadopoulos, 2017). Thus, charter contracts are used for transportation purposes in terms of goods and people, and for that reason, many types of contracts exist and are operated in the maritime industry.

Boat chartering is a widely used practice in the shipping industry and is one of the most important contracts as it generates contractual obligations and claims for the two parties related to the contract (i.e. the charterer and the ship owner). According to

these contracts, a ship owner or the party with the authority to charter the ship, charters (rents) the ship to another party partially or in total for the use of goods transportation or the transportation of people. The charter of a boat becomes official when the contract signed by the parties involved, i.e. the charter-parties, becomes active. The common practice is to use contracts that are recognized and based on standard practice, even though the parties are able to make use of clauses to modify the contracts to accommodate their needs. Official bodies, like the Baltic International Maritime Conference (BIMCO) and the UK Chamber of Shipping, recognize those contracts.

An appropriate categorization of the charters may be based on many criteria that need to be taken into account. First, there is a distinction based on the commercial activity of the boat, from which the two major categories of chartering stem, namely the non-demise charter and the bareboat or demise charter. Then, there is the distinction according to the ship's tonnage, whereby two sub-categories come out, namely time-based and tonnage-based charters (Protopsaltis, 2008).

For the task in hand, the present subsection draws a distinction and underlines the differences among accounting treatment recognition and analysis for the Tonnage Charter-Parties, Time-Based Charter-Parties and Contract of Affreightments.

2.2.1 Accounting Treatment and Recognition for the Tonnage Charter-Parties

As explained above, the categorization of the various charters is crucial from an accounting point of view in order to analyze and record their various effects on the financial statements. Boat chartering through charter-parties is important for the shipping industry because it is the main source of revenue (i.e. Plomaritou and Papadopoulos, 2017). Thus, the accounting treatment of the charter-parties is crucial for every shipping firm, is unique in this business sector, and holds an interest for academic and professional purposes. Therefore, this subsection is devoted to the accounting procedures followed by the shipping firm that are unique to the sector and provides a case-based analysis of the accounting entries. The scope of this approach is to examine how accounting information is generated and recorded in the accounting

books of the shipping firms and to identify the implications under an informational value perspective.

The accounting entries that are presented below describe the accounting treatment of tonnage-based charter-parties. From the beginning of a ship's trip, an accounting entry for tonnage-based charter-parties, concerning receivables and liabilities, must be recorded. That accounting entry should be recorded regardless of the outcome of the trip. An agreed upon trip may be canceled or might not be concluded for any reason. When that happens, the accounting entry is still to be recorded despite the economic consequences that may arise. Those economic consequences are to be treated using different accounting entries and accounts. In the maritime industry, firms possess the flexibility to follow an accounting analysis that better suits their needs.

Freight is the fee for the services provided through the charter-party and is considered an income for a shipping firm. Freight is recognized as revenue when the service agreed upon by the charter-parties is fully satisfied, following the accounting standards that govern the country where the shipping firm is based. Moreover, it is most probable that the recognition of this revenue will follow the accrual-basis accounting principle. Specifically, revenue (stemming from freight) deriving from charter-parties must be recognized regardless of the time of payment completion and collection of the freight (Plomaritou and Papadopoulos, 2017). The accounting entries and treatment presented below regarding the following charter-parties: Whole charter, space charter, voyage charter, consecutive voyage charter, lump sum charter and contract of affreightment (CoA).

Finally, as regards tonnage charter-parties, there are special terms with a significant accounting meaning, namely Laytime, Demurrage and Despatch (Hillenius and Sandevarn, 2018). Every charter-party takes into account the time needed for loading and unloading the ship. The time needed for loading and unloading is crucial and there are special clauses in every charter-party that estimate and set that time for the tonnage of cargo to be loaded and unloaded per day or hour. Thus, laytime is the time needed for loading and unloading the ship.

The Laytime is set in the charter-party. In the case that the shipping firm exceeds Laytime, Demurrage arises in the form of penalties arising from the failure to succeed Laytime (Power, 2018). There is a conflict amongst accounting professionals as to the meaning of Demurrage and how it can be treated from an accounting point of view. Many argue that it is a penalty for failure, but due to the way it is calculated, it seems more like an extra freight, which is why it is recognized as such. Moreover, another case is when the shipping firms do not exceed Laytime. In such a case, the loading and unloading of a ship is completed faster than the expected time. The term for that faster completion is Despatch, and it is a recognized and treated as a freight discount.

The role that chartering brokers hold in the shipping industry is paramount due to the need for anonymity and quick, organized and specialized services for both parties (ship owners and charterers). The chartering brokers are paid through commission, which is called a brokerage commission and is calculated in accordance with the freight set for the cargo at the charter-party. The commission is payable either upon the signing of the charter-party or the loading of the cargo. Every detail regarding the brokerage commission and its payment terms should be stated by the charter-party. It is common practice for charter-parties to mention a commission for the charterers or an address commission. That commission is calculated as a freight percentage but due to the fact that this commission is given to a charterer and not a chartering broker, it isn't actually a commission but rather a freight discount. Thus, the payment of the address commission doesn't cancel the payment for the brokerage commission for the brokers who negotiated the charter-party. As explained above the commission can be recognized as a cost or a decrease of revenue. The common practice is to recognize the brokerage commission and treat it accordingly as a cost and the address of commission or the commission for charterers as a decrease of revenue. Finally, the brokerage commission and address of commission are considered as special terms in a charter-party.

Based on the above, a shipping firm may recognize a tonnage charter-party using the following accounting entry:

Accounting Treatment for a Tonnage Charter-party

Charterers and Agencies		
Foreign Charterers and Agencies		
Imperial Chartering Co SA London	XXXX	
Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Charter-party		
Freight Revenues		XXXX
Freight C/P…. Trip No….. From….to….freight clearance ship Odyssey		

A shipping firm recognizes the charterers and agencies as clients. Therefore, it recognizes any receivables from such clients in the sub-accounts of the account Charterers and Agencies. The Revenues stemming from the charter-party are also recognized along with the receivables. Moreover, due to the international character of the shipping industry, we use the foreign charterers and agencies account as it is common practice.

The credited account Freight Revenue is a sub-account of Service Revenues as the charter-party regards a service stemming from foreign companies. Freight Revenue is a special sub-account for shipping due to the fact that freight is the fee charged for the service provided through the tonnage-based charter-party. It is proper practice to state the charter-party's key information at the end of the entries (Protopsaltis, 2008).

Accounting Treatment for the Special Terms of Tonnage-based Charter-parties

In the case of a Demurrage, whereby the shipping firm exceeded the Laytime, the following accounting entry should be made:

Accounting Treatment for Demurrages

Charterers and Agencies		
Foreign Charterers and Agencies		
Imperial Chartering Co SA London	XXXX	
Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Charter-Party		
Demurrages Revenues		XXXX
Demurrage, Trip No…. , clearance No… , / ……..C/P….. ship Odyssey		

Demurrage, as explained above, is crucial when it comes to tonnage-based charter-parties (Schofield, 2013) due to the fact that it is considered an extra freight and is recognized as such using the above accounting entry. This accounting entry is similar to the one regarding the accounting treatment for tonnage-based charter-parties, but we credit the Demurrages Revenues account. It is of paramount importance to state the information of the Demurrage and the name of the ship at the end of the entry as a shipping firm may manage a vast fleet.

Lastly, if the shipping firm does not exceed Laytime, it should recognize the difference as a discount using the following accounting entry (Protopsaltis, 2008):

Accounting Treatment Despatch

Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Charter-Party		
Freight Reduction due to Despatch	XXXX	
Charterers and Agencies		
Foreign Charterers and Agencies		
Imperial Chartering CO London		XXXX
Despatch trip No….. , clearance No ….. C/P….. Ship Odyssey.		

Despatch, as a freight discount, is considered from the accounting point of view as a form of revenue. Being the opposite of a demurrage (Abrahamsson, 2019), it is treated accordingly by reversing the accounting entries, as shown above in the entry for the accounting treatment of Demurrages.

There is the option of offsetting Demurrage and Despatch due the shipping industry business reality, where a ship in one port can delay loading and unloading and in another may finish faster than the agreed time. From the practitioners' and academics' point of view, though, something like this doesn't hold the same informational value and thus it is not recommended. For example, in many cases, the International Financial Reporting Standards do not allow offsetting due to the loss of information.

Accounting Treatment for Tonnage-based Charter-party (receivables-liabilities)

Receivables from bilateral agreement		
Receivables from Charter-Party		
Receivables from Ship Odyssey	XXXX	
Liabilities from Bilateral Agreements		
Liabilities from Charter-Party		
Liabilities from Charter-Party of Ship Odyssey		XXXX

Signature of charter-party C/P: 5.4.2007 ship: Odyssey trip: Amsterdam-Thessaloniki, Charterer: CDS Amsterdam 10 tons of product for 70£ per ton.

Additional information on receivables and liabilities accounts is recognized, according to the IFRS, in the financial statement's notes (Negkakis, 2015a; Negkakis 2015b). A charter-party is a bilateral agreement and is recognized as such (Power, 2018). Thus, we debit the receivables account for bilateral agreements. Finally, we credit liabilities in the same way. At the end of the entry, the information of the charter-party, such as date, tonnage of goods and cost per ton, is recorded in the transaction explanation part of the accounting entry.

Accounting Treatment for Commissions (Brokerage Commissions & Address Commissions)

Accounting treatment for commissions in the shipping industry is of key importance due to the role of brokers and shipbrokers in charter-parties in everyday shipping business activity. The brokerage commission is mainly considered as an extra operating cost. Thus, we debit the Expenses account Fees and Third-Party Costs and especially the special in shipping industry sub-account Commissions for Charter-party for trips. Moreover, we credit the short-term liabilities account, Creditors and specifically its sub-account Shipbrokers and Brokers specified with the broker's firm name (Protopsaltis, 2008).

Accounting treatment for Brokerage Commissions

Fees and costs of third		
Commissions		
Charter-party Commissions		
Charter-party Commissions for Trips		XXXX
	Creditors	
	Shipbrokers-Brokers	
	Shipbroker JMC New York	XXXX

Brokerages …% percentage of freight, ….as debit note No…./ ….C/P ……Ship Odyssey

Accounting Treatment for Address Commission

Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Charter-party		
Freight Discount	XXXX	
	Charterers and Agencies	
	Foreign Charterers and Agencies	
	Imperial Chartering Co London	XXXX

Address commission…. % percentage of freight… clearance No….. / …. C/P….. Ship Odyssey

From the accounting point of view, the address commission is treated as a revenue deduction. Thus, we debit the revenues account Service Revenues (sub-account Freight Discount). Next, we credit the account Charterers and Agencies, and in particular the sub-account with the name of the agency's' firm. In the accounting entries' explanation, it is important to state the percentage of the commission owed to the brokers, the brokerage and address commission, and the name of the Ship, according to the charter-party.

2.2.2 Accounting Treatment and Recognition for Time-Based Charter-Parties

Another form of chartering practice commonly used by shipping firms is the time-based charter-party. The time-based charter-party is a contract used by firms following the same procedure explained above, focusing not on the tonnage but on the period the ship is used (Brodie, 2015).

The types of time charter-parties are the time charter, demise charter and bareboat time charter. Moreover, another categorization depending on the delivery and redelivery of the ship and the commercial use of the ship are the trip time charter, round voyage time charter and period time charter (Plomaritou and Menelaou, 2020). The payment for the services provided through the time-based charter-party is called Hire, and the hire depends on the charter-party clauses, the type of the ship used, the period of the ship's usage (continuous or periodical) and the type of charter-party chosen.

When it comes to time charter-parties (trip time charter, round voyage time charter, period time charter-party and bareboat charter-party) the charterer incurs the commercial employment for the ship and the voyage expenses (bunkering, lubricants, port dues etc.), whereas the shipper incurs the operation expenses (insurance, repairs etc.) and the ship's capital cost (impairments, financial costs etc.). Despite the kind of charter-party, every aspect of it is thoroughly explained and accounted in the clauses of the charter-party for legal, financial and accounting reasons.

The accounting treatment and analysis of the time-based charter-party is of great importance for every shipping firm and must be taken into account due to the financial importance it holds for the firm. It is either a high operational cost for a firm or a great income source, and thus the proper accounting procedure is critical for not only the financial investors of the shipping firm (after all, shipping firms need excessive financing due to their size and cost of operation), but also the firm's managers. Every decision must be based on the accounting reports and their results. At the end, accounting is a science that concerns the assessment, storing, analysis, use and reporting of information related to a company.

Time charter-parties, as tonnage-based charter-parties, are bilateral agreements and there are also recognized as such from an accounting perspective. Moreover, the time of the boat delivery to be used according to the charter is important and the relevant accounting entry must be recorded upon delivery of the boat according to the time charter. Another issue of great importance from the perspective of the time-based charter-party is the hire. The hire, as explained, is the payment for the services provided and it is common in the shipping industry for it to be down paid. Despite being down paid, the hire is usually recognized upon the conclusion of the time charter where theoretically the hire is claimable (Protopsaltis, 2008).

There are special clauses in every time charter-party with significant financial and accounting effects. These are the bunker clause and the off-hire clause. The bunker clause is the practice where the charterer buys the fuel that already exists in the ship upon delivery. Upon redelivery, the shipper buys back the fuel that is contained in the ship. The oil price is set in the charter-party and is not affected by the market price. Any financial results (profits or loss from the Bunker clause) that may arise from that transaction due to changes in the market value must be recognized by different accounting entries. The off-hire clause states that if the ship, for a reason beyond the charterer's responsibility, is unusable, then that period is not taken into account for the hire and must be discounted.

Finally, when it comes to the commissions owed to the brokers, the same things apply as for the tonnage-based charter-party, meaning that practice implies that

the brokerage commission is to be recognized as a cost for the shipping firm and the address commission is to be recognized as a revenue decrease.

The following accounting entry describes the accounting treatment of Time-Based Charter-Parties (Protopsaltis, 2008):

Accounting Entries for Time-Based Charter-Parties

Charterers and Agencies		
Foreign Charterers and Agencies		
United Time Chartering Co Rotterdam	XXXX	
Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Time-Based Charters		
Revenues from Time Charter		XXXX
Rent from .....to….days, as T/C ship ZEUS		

For the accounting entry above, charters and agents are considered as clients of the ship owner and thus we debit the Charterers and Agencies account, and specifically the sub-account with the name of the chartering firm. Moreover, chartering is considered a service, and thus it is treated likewise. We recognize a revenue, and specifically the Service Revenues, which is a sub-account specifically for recognizing shipping revenues from a time-charter. Information regarding the time-charter as well as the days of the charter and the ship's name are to be mentioned at the explanation of the entry.

In the case of a Demise Charter, the following entry should be made:

Accounting Entries for Demise Charter

Charterers and Agencies		
Foreign Charterers and Agencies		
United Time Chartering Co Rotterdam	XXXX	
Service Revenues		
Service Revenues From Foreign Companies		
Revenues from Time-based Charters		
Revenues from Demise Charter		XXXX
Rent from .....to….days, as T/C ship ZEUS		

When it comes to a Demise charter-party, in accordance to time charter, we debit Charterers and Agencies, and especially the sub-account regarding the specific charterer, as seen above. From the Service Revenues account, we credit the Revenues from the demise charter sub-account relating to the Demise charter-party. In agreement with the previous treatments for time-based charter-parties, revenues are recognized when the hire is due to be paid, and the demise charter-party information should be stated in the explanation of the accounting entry.

Accounting Treatment for Special Terms and Clauses of Time-based Charter-parties

The Bunker clause is an important and key clause for every charter-party. As a consequence, it is a special accounting issue for financial accounting for the shipping industry. The price is set on the charter-party, irrespective of the fuel's market value at the commencing time of the contract. Two entries are to be made; the first when the ship is delivered for use and the second when it is redelivered to the shipper. Ships should contain a certain amount of fuel, which is sold upon delivery from the time charterers to the ship owner, and vice versa (Protopsaltis, 2008). First, we debit the amount owed to the shipping firms in the account charterers and agencies (and the relevant sub-accounts as in the previous accounting entries). Then we credit the relevant revenues.

Accounting Entries for the Fuel Sale at the Ship Delivery Time

Charterers and Agencies		
Foreign Charterers and Agencies		
United Time Chartering Co Rotterdam	XXXX	
Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Time-based Charters		
Revenues from Fuel oil 150 Sale		XXXX

Value…. Tons of fuel oil 150 upon delivery of ship Zeus as T/C invoice or debit note….

As explained above in the previous accounting entry, the fuel cost is paid back upon redelivery from the ship owner to the time charterer. In the relevant accounting entry, we first debit the sub-account bunkering with additional analysis in a sub-account relating to the fuel type (as explained above, this is important cost-wise). Second, we credit the charterers and agencies accounts as seen above. It is crucial for the charter-party special fuel clause to present the relevant key information in the explanation of the entry.

Accounting Entries for Fuel upon Delivery Time of the Ship

Consumables		
Bunkering		
Fuel Oil for Ships		
Fuel Oil Ship ZEUS	XXXX	
Charterers and Agencies		
Foreign Charterers and Agencies		
United Time Chartering Co Rotterdam		
United Time Chartering Co Rotterdam Ship ZEUS		XXXX

Value …. Tones Fuel oil upon redelivery of ship ZEUS as T/C …. credit note or invoice

Off-hire is the period when the ship is not used and thus hire isn't paid for that period. In turn, this period is considered and treated as a hire discount. For the task in hand, we use a sub-account that is unique in the shipping industry, called off-hire. Then we credit charterers and agencies as seen above. Information about the off-hire period is stated at the explanation of the entry (Protopsaltis, 2008).

Accounting Entries for the Off-hire Clause

Service revenues		
Service Revenues from Foreign companies		
Revenues from Time-based Charters		
Off-hire	XXXX	
Charterers and Agencies		
Foreign Charterers and Agencies		
United Time Chartering Co Rotterdam		
United Time Chartering Co Rotterdam Ship ZEUS		XXXX

Off-hire from….till…, Days….to… /days ship ZEUS, as T/C, debit note…etc.

The same entries used for the tonnage-based charter-party, concerning receivables and liabilities, are also used for the time-based charter-parties. It is common practice to prepay the hire. From an accounting perspective, it is recognized as a revenue, whereby it is considered accrued at the completion of the charter-party. The differences appear on the special time-based charter-party sub-accounts that concern the type of charter-party and its duration (Protopsaltis, 2008). Finally, information about the charter-party, like the days of charter agreed upon in the charter-party and the daily hire, is disclosed in the explanation of the accounting entry.

Accounting Treatment for Time-based Charter-party (receivables-liabilities)

Receivables from the bilateral agreement		
Receivables from Time Charter-party		
Time charter ship ZEUS from 4.3.20X8 till 4.12.20X8	XXXX	
	Liabilities from bilateral agreements	
	Liabilities from Time Charter-Party	
	Liabilities from T/C of Ship ZEUS	
	From 4.3.20X8 till 4.12.20X8	XXXX

Signature T/C on 5.1.20X8, ship: Ship ZEUS from 4.3.20X8 till 4.12.20X8, Charterer: MSCA LTD London 274 days for 7000£ daily.

Accounting Treatment for Commissions for a Time-based Charter-party (Brokerage Commissions & Address Commissions)

The importance of commissions and their accounting treatment, when it comes to charter-parties, has already been analyzed above. Brokerage and address commissions are treated for time-based charter-parties the same way they are treated for tonnage-based charter-parties. The differences in the entries relate to the use of sub-accounts, wherein the charter-party type is stated. The brokerage charter-party is recognized as an extra operating cost and is treated accordingly.

Accounting treatment for brokerage commissions

Fees and costs of third		
Commissions		
Charter-Party Commissions		
Time-based Charter-Party Commissions	XXXX	
Creditors		
Shipbrokers-Brokers		
Shipbroker JMC New York		XXXX
Brokerages …% percentage of freight,….as debit note No…./ ….C/P ……		

Commission for charterers or address commission is treated as a decrease of revenue in the same manner as for tonnage-based charter-parties. The differences are in the sub-accounts, wherein the charter-party type changes. Finally, key information about the commission agreement needs to be mentioned (commission according to freight percentage).

Accounting Treatment for Address Commission

Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Time Charter-Party		
Time Charter Discount	XXXX	
Charterers and Agencies		
Foreign Charterers and Agencies		
Imperial Chartering Co London		XXXX
Address commission…. % percentage of freight… clearance No….. / …. C/P….. Ship Odyssey		

2.2.3 Accounting Treatment and Recognition for Contract of Affreightments (Bills of Lading)

The ways of operation for the shipping firms are as a charter-party (tonnage based or time based), as explained above, and through contract of affreightments, which have been the traditional way of contracting in shipping (Stalhane et al., 2014).

There is an issue when it to comes to differentiating between the tonnage-based charter-party and the contract of affreightment of goods. The solution to that problem derives from their main difference, which is the way they are issued. For example, the tonnage-based charter-party needs a charter-party to exist, while the contract of affreightment needs, respectively, a bill of lading. The definition of the bill of lading derives from its functions: the bill of lading can be a contract of affreightment, a receipt of the goods used, a document of title and a documentary credit.

The most common standardized bill of lading in the international shipping practice are the following: Clean bill of lading, Foul bill of lading, Received bill of lading, Shipped bill of lading, Direct bill of lading, Transshipment bill of lading, Thorough bill of lading, Combined bill of lading, Groupage bill of lading, Open bill of lading, Named bill of lading, Order bill of lading, Negotiable bill of lading, Non-negotiable bill of lading, Sea waybill, Liner bill of lading and Sort bill of lading.

It is critical to state the differences between thorough bill of lading and direct bill of lading, as the former needs special accounting treatment. As a procedure, it takes place amongst many transporters, whereby the original transporter assumes the responsibility under a single freight to transship the load until it reaches the final destination. The Thorough bill of lading, compared to the standard bill of lading, is different in its content, issue, financial value, and value as a security that is to be exchanged. The accounting treatment for that specific bill of lading differs from the perceptive of the shipping firm regarding whether the firm is the first carrier or the transship carrier of the goods.

Bills of lading that are issued as part of the tonnage charter-party are negligible from the accounting point of view as they are considered part of the charter-party. Bills of lading, however, that are not part of a charter-party need special accounting treatment. Agencies' clearances, the cargo manifest, and other documents derived from the management of the cargo support the contract of affreightment (bill of lading) in order for the freight to be receivable and the accounting entries to be recorded (Protopsaltis, 2008). The freight for a bill of lading is recognized as revenue from the contract of affreightment and brokers and agencies are recognized as clients of the shipping firm due to their key role in completing the contract of affreightment.

The commission that arises for the agencies for their role in issuing a bill of lading is considered as a cost for the commercial use of the ship and is treated accordingly.

Accounting Treatment for Bill of Lading of Contracts of Carriage

Charterers and Agencies		
Foreign Charters and Agencies		
Agency QEG London		
Agency QEG London Ship Duchess	XXXX	
Agency VMS Bristol		
Agency VMS Bristol Ship Duchess	XXXX	
Agency PQS Portsmouth		
Agency PQS Portsmouth Ship Duchess	XXXX	
Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Contracts of Carriage		
Revenues from Bills of Lading		XXXX

As summary table… of the agencies clearance and cargo manifest of ship Duchess, trip No…./…..

Freights derived from bills of lading are considered service revenue stemming from contracts of carriage. Charterers and agencies are a key account due to the importance of charterers in a bill of lading. As a result, they are considered as the clients of the shipping firm and they are treated as such.

Based on the above, in the relevant accounting entry we debit charterers and agencies (there may be more than one in a bill of lading) and we credit service revenues, and especially service revenues from contracts of carriage and bills of lading. Key information about the bill of lading and the ship's name should be mentioned in the explanation of every accounting entry.

Accounting Treatment for Through Bill of Lading of Contracts of Carriage

A Thorough bill of lading is commonly used and requires special treatment due to its complexity. As explained above, a Thorough bill of lading is the shipment of goods using different ships until they reach their final destination. The accounting treatment for a Thorough bill of lading depends on the ship's role in the transportation, meaning that there is a different accounting treatment when the shipping firm is the first carrier of the goods and when it is an in-between carrier.

In the case where the shipping firm is the in-between carrier, because the freight is received from the first carrier and owed to the in-between carriers, the first carrier is recognized as a client. In accordance with the above, we debit the creditor's account, and especially the receivables from first transporter and the sub-account named after that transporter (Protopsaltis, 2008). Continuing, we credit the service revenues account, and especially the Revenues from the Thorough Bill of Ladings sub-account.

Accounting Entries in the case of a Shipping Firm being the in-between Carrier

Creditors		
Receivables from First Transporter		
Master Transport Lines SA Rotterdam		
Master Transport lines SA Rotterdam Ship Atlantic II	XXXX	
Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Contracts of Carriage		
Revenues from Through Bill of Lading		XXXX

As summary table… of the agencies clearance and cargo manifest of ship Atlantic II, trip No…./…..

Special accounting treatment is needed when the transporter is the first carrier. In this case, the clients are the charterers and agencies and the revenues should be entered carefully and by taking into account the payment for the in-between carriers (Protopsaltis, 2008). Thus, in such a case we credit the creditor's account and then liabilities to transporters. It is crucial to enter all the in-between carriers and the name of the carrying ship in the information of the accounting entry. After we record the in-

between carriers, we recognize the freight paid to the first carriers by crediting the Service Revenues account, as explained above. At the end of the entry, key information on the bill of lading should be mentioned in the entry's explanation.

Accounting Entries for Revenues from Through Bill of Ladings Freights under the Condition that the Shipping Firm is the First Transporter

Charterers and Agencies		
Foreign Charters and Agencies		
GFR Agency International London		
GFR Agency International London Ship Atlas IV	XXXX	
Global Connection Agencies New York		
Global Connection Agencies New York ship Atlas IV	XXXX	
EMST Agents Amsterdam		
EMST Agents Amsterdam Ship Atlas IV	XXXX	
Creditors		
Liabilities to Transporters		
Shipping firm ICN SA		
Shipping firm ICN SA Ship Atlas IV		XXXX
Transport Company Thomson SA		
Transport Company Thomson SA Ship Atlas IV		XXXX
Service Revenues		
Service Revenues from Foreign Companies		
Revenues from Contracts of Carriage		
Revenues from Bill of Lading		XXXX

As summary table… of the agencies clearance and cargo manifest of ship Atlas IV, trip No…./…..

The commission that the shipping firm owes to the charterers and agents for issuing the bill of lading and thorough bill of lading is considered as an operating cost for the ship and is treated accordingly. We debit the Fees and Costs of Third account, and especially the sub-account commission for bill of lading. The reason we credit the Charters and Agencies account is because the maritime agents collect the freight from the bill of lading (Protopsaltis, 2008). Every firm taking part in the transaction should be mentioned and credited in the sub-accounts, as presented below. Finally,

information about the bill of lading should be mentioned at the explanation of the accounting entry.

Accounting Treatment for Special Charter-party Terms (Commissions to Brokers)

Fees and costs of third		
Commissions of Third		
Commissions for Bill of Lading		
Commissions for Bill of Lading Ship OLYMPIA I	XXXX	
Charterers and agencies		
Foreign Charters and Agencies		
GFR Agency International London		
GFR Agency International London Ship		
OLYMPIA I		XXXX
Global Connection Agencies New York		
Global Connection Agencies New York Ship		
OLYMPIA I		XXXX
EMST Agents Amsterdam		
EMST Agents Amsterdam Ship OLYMPIA I		XXXX

As summary table… of the agencies clearance and cargo manifest of ship Olympia, trip No…./…..

2.3. Auditing Aspects of the Shipping Industry

The auditing procedure of a shipping company resembles that of a firm from another industry regarding the general provisions. In this respect, a shipping firm will set up an internal auditing department that will have to perform the main operations of the internal auditing process, mainly to provide all the necessary information to the management of the shipping firm in order to efficiently manage it. On the other hand, the shipping firm will also be audited by an external auditor, who will be responsible for auditing the financial statements and ensure that they are consistent with the accounting standards implemented by the firm (Negkakis and Tachinakis, 2017).

Despite the similarities of the internal and external auditing procedures, there are some issues that worth further investigation; these are presented below.

2.3.1 Internal Auditing for the Shipping Industry

As underlined above, the shipping industry is a large and international sector. Managers and ship owners need to control and operate ships that travel all over the world at any given time. This is one of the unique aspects of the shipping industry. With the need to operate ships with an international crew all over the world in places with different legal systems and regulations as well as to cooperate with a number of agencies and brokers globally, up-to-date trustworthy and correct information is crucial to success. As a result, a key internal procedure for the shipping firm that ensures the credibility of information to efficiently manage the firm and succeed is internal control.

According to ISA 400 (International Standard on Auditing 400), an internal audit system is basically the organizational structure where the optimal goal for the company's management is for the procedures and strategies to be completely harmonized and perfectly organized to the maximum amount in order for the company to achieve its purposes. Nagy and Cenker (2002) point out that a second role for the audit department is to ensure that through its consulting activity to the management, the value of the operations of the firm will increase.

Moreover, internal audit system focuses on the managements rules of operation, the safeguarding of the company's assets and the timely detection of every possible operational and managerial wrongdoing and risks. In addition, it focuses in the informational value of the company's bookkeeping records by controlling its accuracy and correctness. An internal audit control system helps to control the credibility and robustness of the company's financial information. Finally, an internal audit and control system expands in every managerial aspect, and not only the accounting and financial department, as it helps the directors and managers to be better informed and consulted on every issue at hand (Protopsaltis and Sarikostidis, 2003).

The shipping industry is international, highly competitive and decentralized (Jansson, 2012). Thus, a proper internal audit department is crucial for a shipping firm's operation and control. It is crucial for an internal audit system that the shipping firm abides by certain rules and principles. Those relate to the adequate accounting organization in order for the management to have complete financial control before deciding on any strategy. Moreover, there should be proper operational segregation and allocation of responsibilities, integrity and personnel capability and finally protecting measures to safeguard the company's assets (Arens et al., 2017).

It is important for a correctly operating internal control system to set certain standards concerning receivables and revenues (Negkakis and Tachinakis, 2017). Responsible, trustworthy and specially appointed personnel should conduct the task of revenue collection and estimation (hire or freight) in addition to every other task concerning the receivables for the shipping firm. Moreover, the person handling the accounts and the business deals with clients should never be the one who makes the accounting entries or has any part in the accounting department.

Every business deal made by the personnel mentioned above should be examined by the directors and managers and then approved. Every approving communication should be controlled, completed and monitored by an employee outside the accounting department, thus securing the integrity of the approval. Every debit given to customers and every check received should be checked by the managers of the appropriate department (Messier et al., 2017). Every receivable amount should be checked for collectability and liquidity, so that every potential financial loss can be calculated. Financial information about clients should be requested and received, especially when necessary. Finally, all the documents concerning the receivables should be properly and safely kept. Clearly, it is crucial for any shipping firm to segregate operations and responsibilities and also set approval measures in order to secure the integrity of its operations (Protopsaltis and Sarikostidis, 2003).

2.3.2 External Auditing for the Shipping Industry

The external auditor of the shipping firm should audit the financial statements in order to express their expert opinion on the extent to which they are in agreement with the accounting standards (ISA 200- IAASB, 2009). Every auditor at the beginning of the audit for a shipping firm should take into consideration certain issues regarding the specifics of the auditing procedure in a shipping firm. First, the auditor must be informed concerning the shipping firms' legal structure, operational structure and financial structure. Moreover, if possible, the auditor should visit the ships and learn firsthand about every employee's responsibility and in addition check the on-board books. As already stated, it is important for the auditor to assess the effectiveness of the internal audit because if it is properly executed, then they can quickly retrieve information about the company. In this respect, ISA 610 sets the basic principles for the external auditor in order to decide whether they can base the audit procedure on the work of the internal auditor (IAASB, 2013).

The most commonly used method for the internal audit and control department is the use of questioners and checklists. Based on the above, the checklists can be used from the audit department to retrieve information about the proper operation of the firm and examine the authenticity and integrity of the financial information given from the internal audit and control department. Those questioners should focus on certain aspects. First, the bookkeeping procedures, especially regarding timely processed accounting entries and alignment with the accounting standards that each firm uses (IFRS, US GAAP and every other local standard), should be examined for consistency. Moreover, questioners should also check the way receivables, bank accounts, tangible and intangible assets, revenues, liabilities and other major accounts are treated and controlled by the internal audit system according with the standards set by the department (Messier et al., 2017).

Another crucial aspect for the auditors to examine is revenues. Some standard and general procedures should be followed in the revenue audit. Firstly, special detailed boards of per revenue category should be established. Then, revenues from past uses should be crosschecked and differences should be justified.

Moreover, there must a correlation between revenue accounts and other major accounts, like agents and charterers or bank accounts. A random testing for revenues and the paperwork following the transactions is recommended. It is important for the auditors to categorize the revenues from the legal and accounting points of view so they can be treated accordingly (Negkakis and Tachinakis, 2017).

One of the greatest income sources for shipping firms are the freights and hires deriving from the charter-parties. The charter-parties fall under different categories, like time-based, where the payment for the service is called hire, and tonnage-based, where the payment for the service is called freight. Moreover, contracts of affreightments are vastly used for the transport of goods. The auditor should differentiate every different charter-party and find out in which category it falls and the way the freight and the hire are calculated. Then, according to the charter-parties clauses, the auditor should check when the payment is due and if the accounting entries and the revenues follow the charter-parties agreements or whether there are discrepancies (Protopsaltis and Sarikostidis, 2003).

Overall, the internal and external audit procedures for a shipping firm are crucial for its well-being. The reason is that the main assets of the firm, namely the ships, travel globally across the sea and are exposed to a great number of diverse risks, such as adverse weather conditions and piracy. Therefore, the internal control department is responsible for managing these risks, while the external auditor is responsible for auditing the financial statements and ensuring they reflect the reality of the shipping firm.

2.4 Cryptocurrencies and the Shipping Industry

The global nature of shipping firms' operations and the high need for funding and fund transfer have created the need for fast, secure and high-amount transactions between firms domiciled in various countries and operating on various currencies. Cryptocurrencies may offer a solution to these needs.

Cryptocurrencies are the outcome of the effort to develop electronic means of payment that are not controlled by central authorities. The first effort that led to fruitful results was Bitcoin, which is attributed to Satoshi Nakamoto (Nakamoto, 2008). Nakamoto is likely not a real person (Crosby et al., 2016), but most probably an alias for a person or a group of persons who in 2008 circulated the seminal paper titled "Bitcoin: A Peer-to-Peer Electronic Cash System". Through this paper, the author/s described a digital currency that was not issued/controlled by a central institution, like a central bank, along with the cryptographic methods that were used to achieve the anonymity of the users and the impenetrability of the stored data on transactions.

Bitcoin brought about a vast array of changes during the last decade. Along with the popularity gained (i.e. Urquhart, 2016), a large number of new cryptocurrencies offering expanding characteristics was offered to the cryptocurrency market. These characteristics offered additional and improved services in relation to the key characteristics of Bitcoin. Among these improved characteristics are the faster time for fund transfer, with some cryptocurrencies being able to transfer funds electronically in near real time. In contrast, the fund transfer through classic methods (i.e. through a bank) may take considerable time. Moreover, the fees required to transfer the money are also reduced in the case of the cryptocurrencies compared to classic methods. Dwyer (2015) argues that the use of cryptocurrencies as a means of conducting electronic transactions can lead to very low fees. Moreover, since there is no need for a central market, transactions can be made on a 24/7 basis.

However, these characteristics do not come without cost. The cryptocurrencies are highly volatile assets (Walther et al., 2019). Ma et al. (2020) argue that past Bitcoin volatility may lead to high current Bitcoin volatility in the short term. However, Yi et al. (2018) show that volatility spillovers in a network of cryptocurrencies stem not only from Bitcoin but also from other cryptocurrencies. Plassaras (2013) argues that the inexistence of a central authority like the IMF to govern the cryptocurrency market leads to high volatility. Vogt (2017) argues that the anonymity offered by the cryptocurrencies may lead people to use them for illegal purposes. Marian (2013) contends that cryptocurrencies may offer tax haven characteristics without the need to be actually incorporated in such a jurisdiction.

Specifically, the anonymity, along with the ease of transaction, may help individuals to transfer large amounts of money without being taxed or located by governing institutions since there is an absence of an oversight body for cryptocurrencies. Liu and Tsyvinski (2018) argue that the time series of the cryptocurrencies they examined do not relate to other risk factors that have been found to relate to classic investment assets like stocks or bonds. Urquhart (2016) argues that the Bitcoin market shows signs of inefficiency under certain conditions. These factors create significant risk that must be hedged in order to use cryptocurrencies as a means of conducting transactions.

Even if maritime firms solve the problem of high risk related to the use of cryptocurrencies, they would have to face a last but significant problem that has to do with the appropriate accounting treatment of such instruments. Previous research has shown that in most countries, there is no accounting standard relating to cryptocurrencies, with the exception of Japan, which has identified cryptocurrencies as a separate category of assets (ASBJ, 2018). Therefore, in order to take advantage of the merit of cryptocurrencies, shipping firms must first deal with the problems of accounting treatment, the increased skepticism of most countries, and the high volatility of their prices.

The proposed accounting treatment of the Accounting Standards Board of Japan seems to be in the right direction. Specifically, the characteristics of the cryptocurrencies (high volatility, high risk and operational risk related to their economic environment) do not qualify them as instruments that could be recognized as cash or cash equivalents according to IAS 7. On the other hand, a study by the Australian Accounting Standards Board (Venter, 2018) argues that cryptocurrencies do not qualify as financial instruments based on the definitions of the IFRS, but rather have the form of an intangible asset held for sale. In this respect, the AASB argues that this alternative accounting treatment (recognizing the cryptocurrencies as intangible assets available for sale) would also call IAS 2 Inventories to be used for their valuation.

Therefore, the use of cryptocurrencies as a form of electronic currency may alleviate a number of serious problems faced by the shipping firms. These problems

relate to the transaction fees that are generated in the banking system as well as foreign exchange risk. The use of cryptocurrencies may provide fast, secure and fee-less transactions. However, in their current state, cryptocurrencies are characterized by high volatility and risk relating to the operation of a market that is not governed by a central institution. Therefore, the shipping companies should adopt the use of cryptocurrencies as means of payment conditional on alleviating their problems.

In contrast, the technology upon which cryptocurrencies are based, namely blockchain technology, may find several useful applications in the shipping industry. The blockchain is a method of cryptographically recording data in groups called blocks and then transferring this information to all the participants of a network. It was developed by the abovementioned Nakamoto (2008), who was searching for a way to record information on transactions without the need for a central authority to validate these transactions.

The blockchain was the solution to this problem. Specifically, Nakamoto created a network of participants that validated the information on the transactions. After the validation procedure, the information is recorded in a public ledger and is accessible by all. However, the participants in these transactions are not identified by their real identities but rather by their public (anonymous) identities.

Therefore, the information on the actual amounts and the public identities (acting as pseudonyms) is publicly known, but the actual identities are not known. The blockchain offers several advantages compared to the classic database approach in recording information. First, the data recorded in a blockchain offer increased security against attempts to intervene and alter the data. Moreover, in terms of compatibility, it offers a range of characteristics that help in disseminating the data, something that could not be done with traditional database services due to incompatibility issues.

Czachorowski et al. (2019) argue that the blockchain technology can help the shipping industry in various ways. One of these is in data management, which can extend several gigabytes per day. The blockchain technology along with big data technologies could offer viable solutions to the problem of storing and assessing

information in large volumes. Indeed, the authors refer to several projects that currently use blockchain applications and argue that it may be the future in data handling in the maritime sector.

In sum, the use of blockchain technology has only merits to provide to the shipping industry. It will greatly reduce the operating costs, which can be high for a shipping firm (Panayides et al., 2011). These costs relate to the data handling of the shipping firms as well as the agency costs due to the public nature of its database. Hence, shipping firms should expedite the adoption of the blockchain technology along with big data applications and incorporate these into their enterprise systems, which will greatly help in controlling the cost of information handling and efficiently managing the firm.

2.5 Conclusions

The present chapter examined the accounting and auditing procedures of a shipping firm. The main results of the chapter indicate that this sector has some important differences compared other economic sectors, thus underlining the need to assess and evaluate these differences from an accounting and auditing perspective.

The main results of the chapter, stemming from the case analysis, show that the accounting procedures should be tailored to the way the shipping firm transacts with other firms and initiates chartering contracts. Moreover, the analysis of the auditing procedure indicates that the internal and external audit also have to deal with differences in the auditing procedure compared to other firms. This is based on the fact that the major assets of the shipping firms operate globally and are exposed to different risks, ranging from terrorist attacks to health issues (like a pandemic) and of course foreign exchange risk.

The last part of the chapter examined new financial technologies that could be adopted by shipping firms and the problems they could solve. These technologies regard cryptocurrencies and the blockchain. The chapter concentrated on the merits of adopting the use of cryptocurrencies as a means of digital payment and the use of blockchains and big data to handle the large costs incurred by the creation of data in

the everyday business of a shipping firm. From an accounting point of view, adopting cryptocurrencies as means of payment would require a new accounting standard to prescribe the appropriate accounting treatment of such instruments.

CHAPTER 3

Accounting Standards and the Financial Statements of Maritime Companies

3.1 Introduction

The present chapter examines the effects of accounting standards and their implementation for the financial statements of maritime firms. The influence of the shipping sector relates to its importance for global trade as the shipping industry is responsible for 80-90% of the world trade, with different types of ships carrying different types of cargo (UNCTAD, 2018). There are different kinds of ships in order to accommodate every type of transported good. It goes without saying that the ships, as assets, are critical in the shipping industry and every different type of ship relates to different prices, different value, and different second-hand market value.

As argued in the first chapter, shipping firms need to decrease information asymmetry in order to better accommodate their funding needs through the capital markets. Therefore, they attempt to curb information asymmetry through accounting procedures. In this quest, shipping firms may face problems relating to the decision to lease ships or recognize impairments, which in turn may affect a firm's performance and the information content of the financial statements. Therefore, the present chapter attempts to examine these issues in regard to information asymmetry and assess how decisions on the lease or the trigger of any impairment tests and the recording of associated losses may affect the financial condition of the firm.

The methodological analysis is based on three distinct variables, namely the recognition of asset impairments (used either as a binary variable indicating the recognition of an impairment or as a continuous variable indicating the magnitude of an impairment), the use of operating leases, and the existence of discretionary accruals that lead to earnings management. The choice of these three characteristics is made on the premise that maritime firms have distinct characteristics in relation to other industries. Specifically, these firms have high tangibility ratios, high corporate cash holdings, high leverage (Drobetz et al., 2013; Ahrends et al., 2018) and global operations, which in turn requires critical decisions for impairment testing and the use of leases. Moreover, the high tangibility ratios (high-value fixed assets) make the recognition of impairments and operating leases an important procedure for shipping firms, while the high need for funding leads to the need for low information asymmetry and high financial reporting quality in order to attract funds, which does not leave space for high earnings management.

Specifically, these characteristics raise important implications for specific items of the financial statements of shipping firms. High tangibility ratios and a high fraction of high-valued assets, like ships, leads to the assertion that the presence of any significant impairments will have a major effect on investors and the other users (i.e. stakeholders) of financial statements due to the effects on performance. First, we attempt to uncover the characteristics related to the recognition of the impairments of shipping firms. For this research task, we use a sample of US firms. At a second stage, we review the use of earnings management for shipping firms and also attempt to examine whether the recording of impairment losses is affected by any incentives for earnings management. Second, given the important role of chartering for shipping firms, we examine the effects of leases for shipping firms on their performance. Third, we assess the determinants of earnings management in shipping firms as well as its likely relationship with the recognition of impairments. We perform a number of robustness checks. First, the study examines the robustness of these results in relation to the accounting standards that a shipping firm uses, specifically the use of IFRS for a sample of international shipping firms. We also examine the effects of the shipping crisis of 2008-2010 as well as their cross-effects.

The rest of this chapter is structured as follows: Section 3.2 reviews the literature on the effects of financial reporting in the shipping industry, including leases, revenue recognition and impairments; Section 3.3 presents the research methodology, while Section 3.4 describes the sample. Section 3.5 analyzes the empirical results and finally, Section 3.6 concludes the chapter and offers implications for future research.

3.2 Literature Review and Research Hypothesis

3.2.1 Accounting Standards and Shipping

Financial reporting is an issue of great value and complexity when it comes to the shipping industry. The unique characteristics of this industry create the need for a specialized and delicate approach regarding the analysis of financial reporting quality. The implementation of International Financial Reporting Standards (IFRS) provides a set of high-quality accounting standards that also impact the financial reporting quality of the shipping firms.

Thus, there is an abundance of factors that may affect the value of a ship, and in turn, its valuation for a shipping firm. First, a ship may take considerable time to be built as well as significant funds. The most common vessel types in the shipping industry, and especially the maritime transport sector, are dry bulk carriers (see also Kalouptsidi, 2014, on Time Build and Fluctuations on Dry Bulk Shipping), oil tankers and container ships. Dry bulk vessels are used to transport iron, coal, grain and similar cargo. Tankers are used for oil and its products and different types of chemicals, and finally, container ships are used for the transportation of goods. Container ships are responsible for almost half the seaborne trade by monetary value due to the high unit value of the goods they carry. These great differences between the various types of ships create differences in their valuation and pose difficulties regarding their accounting treatment since they are high value assets.

Another factor that affects the accounting treatment of a ship is its useful life. The age distribution of the world merchant fleet is much extended. The average age of

the world commercial fleet is 20.8 years, and when taking into account the dead-weight tonnage, the average age is 10.1 years due to the greater size of the newly built ships (built in the ten years prior to 2018). Therefore, ships are long-lived assets of high value that operate globally on a constant basis and carrying every kind of cargo, making the accounting approach for a ship as an asset a very delicate procedure (UNCTAD, 2018).

From the discussion above, it seems that there are standards that affect the shipping industry in different ways than the other industries. Regarding International Accounting Standard 16 (IAS 16), in the maritime industry, where ships are an essential and a high-value asset, IAS 16 and its correct implementation are a crucial issue. According to IAS 16, all expenses that are required for the ship to be brought to a seaworthy condition can be capitalized. Thus, any costs that emerge through shipyard charges can be included in the cost of the ship along with the ship's agreed contract price. The IAS 16 states that for every different part of a property, plant and equipment item that requires separate depreciation arrangements and the rates that apply are diverse, every part is depreciated accordingly. In order to divide the property, plant and equipment into different parts, IAS 16 requires that every distinct part is crucial to the total value of the asset. There is no need for the item part to be physical as it can also be non-physical. Finally, even though it is mandatory, the procedure of Component Accounting does not require an infinite distinction of parts.

According to KPMG (2012), despite the different methods of depreciation that are available by IAS 16, the straight-line method of depreciation is the most commonly used in the shipping industry, although some companies use component accounting when in dry-dock. The issue that arises with that procedure is the estimation of the useful economic life of the ship. Many things must be taken into account for the estimation of the vessel's economic life or that of its components. Those issues are products of the operating cycles, vessel deployment, continuous technological improvement, and regulations. Moreover, the market condition and the repair policies play a great role when it comes to the calculation of the economic life of a vessel. Due to all the above, the estimation of the economic life of a ship is shorter than its actual life as measured from an engineering point of view.

Another example of the impact that IAS 16 has on the shipping industry is the estimation of the residual value, which is the amount that the company will gain from a vessel by selling it, estimated at the time of reporting and if the ship is in a condition in which the company will naturally dispose of it. The calculation of the residual value is based on the price of similar vessels at the end of their useful economic lives. As ships are made of steel, their residual value can be considered material due to the scrap market. The problem with estimating the residual value with steel prices is that the steel market is volatile, so a new estimation of the residual value is due only if extreme changes exist in the material market.

In addition to the accounting treatment of the ship at its initial and subsequent valuations, ships that travel globally, carrying heavy cargos and confronting extreme weather conditions, need repairs. The repair procedure in the shipyard is called dry-docking. Dry-docking is crucial for a ship's "well-being" and it is an expensive and time-consuming procedure (from 12 to 24 months, every 2.5 years for small-scale ships and every 5 years for the large-scale ships). In order for dry-docking to take place, the ship must be taken onshore at the shipyard and be properly repaired, which is why it takes so much time. In accordance with IAS 16, all expenses for the repair need to be capitalized.

The introduction of the implementation of the IFRS 9 Financial Instruments also affects the shipping industry in many ways. First of all, it has a great impact on hedge accounting. With maritime companies, there is an issue of high-risk exposure to commodity prices. Within IFRS 9 there are new provisions that allow a risk to be hedged in part, such as crude oil prices on non-financial items, if certain criteria are met. These criteria include that any change of the fair value or of the cash-flow of the non-financial item is easily measurable and that the difference between the risk component and the financial item is clearly detectable. Another change that IFRS 9 introduces concerns Classification and Measurement. The criteria that change through IFRS 9 will certainly affect the shipping industry. A business model test is used for financial assets (receivables, debt investments). The financial assets for trading, on the other hand, are measured by profit or loss. Moreover, the embedded derivatives are checked in order to determine whether they are to be categorized as amortized cost or classified at fair value. Finally, when it comes to impairments, IFRS 9 directs that by

using credible information, companies must identify and bring up to date any anticipated credit losses at any given time and during reporting dates.

As noted above, the high value of a ship and the harsh conditions it may operate in create the need for impairment testing. In this respect, IAS 36 is another important accounting standard used in the accounting treatment of the ship. Specifically, apart from the high value of the ship and the extreme weather conditions it operates in, other factors, such as changing regulations, terrorist attacks and high volatility in the shipping market, create additional trigger events for impairment testing.

In addition, another standard that affects the shipping industry is IFRS 11 Joint arrangements. Joint arrangements are separated into joint venture and joint operations, where in the first case the participants have authority over the assets and in the second case the participants are responsible for the obligations that may arise from the joint operations. It is crucial in the shipping industry that every joint arrangement is checked in order to clarify the type of arrangement.

It is clear that the accounting standards and their use are crucial in the shipping industry due to the fact that they affect it not only financially, but also when it comes to decision-making about the critical aspects of firm operations. These characteristics imply that several factors relating to accounting should be important for ships. Specifically, shipping firms should maintain a significant amount of cash to fund the purchase of new ships or remove the need to sell ships. Second, the global operations and significant value of the firm are particularly related to the impairment of the firm. Specifically, global operations increase the operating risk of the ship and the likelihood of impairment losses, while the high value of the ship may lead to a high amount of impairments, leading, in turn, to significant losses recorded in the income statement. Third, leases are particularly related to this industry since firms may operate ships on a lease basis. Fourth, due to their large size and high operating risk, shipping firms may face significant losses in their income statements arising from sources other than impairments.

3.2.2 Leases

Shipping firms use leases as an important aspect of their business practice. Specifically, shipping firms classify chartering as a capital lease and thus record the relevant liability (Nam and An, 2017). Thus, in order to further comprehend the essentials in the shipping industry, one must know about chartering and the charter market in the shipping industry. To begin with, chartering is a legal agreement, an agreement of commercial employment. That agreement is made between the owner of the ship and the charterer. The interests of the ship as a commodity are naturally represented by the owner of the ship, while the charterer charters the ship for a specified (in the chartering contract) period of time to execute a clarified cargo voyage. The payment for the chartering is called freight or hire and the contract is called Charter-Party (see also Plomaritou and Papadopoulos, 2017). The charter thus is commercial employment.

There are four types of chartering (Plomaritou and Papadopoulos, 2017). The first is called spot charter or voyage charter, and the characteristics of that chartering type are that the time period is short and the owner of the ship is to transport a cargo of specified quantity from port A to port B. This is why this type of chartering is named spot or voyage. The payment (freight) of this charter is calculated in US dollars and the way of billing is through the weight (calculated in tones) of the cargo that is to be shipped. Meanwhile, the second type of charter contract is called time charter. The key factor in this type of charter is that the charter is allowed by the owner of the ship to take control of the commercial employment of the ship for a clarified period of time. The duration can be short, medium or long, according to the need and the agreement between the charterer and the ship owner.

The owner, on the other hand, retains all the other operations of the ship, e.g., the repair, insurance, crewing, etc. The payment of the transaction between the charterer and the owner is most commonly calculated daily and it is called hire. The hire is payable as set by the agreement of both parties (for example, every 10 days). Moreover, there is the Contract of Affreightment (CoA), which is a type of charter whereby the owner of a ship transports a certain good (of the same type) in a clearly defined quantity and time over a set amount of time. The number of the voyages taken

is clarified, but the ship that does those voyages is not. The duration of the charter can be medium or long term and the owner is paid in US dollars. The freight, as it is called, is the calculation of the tons of goods transferred in a voyage paid in US dollars. This is why the Charter of Affreightment (CoA) is considered a mixture of the different types of charter. Finally, there is the Bareboat or Demise Charter. The duration of the charter can be medium to long and in the Bareboat charter, the charterer hires the ship for a certain period. The control of the ship passes to the charterer in full and in return, and the charterer in return pays a hire set on a daily basis in advance (for a month or fifteen days). During the chartered period, the ship owner is responsible for the capital cost of the ship (Plomaritou and Papadopoulos, 2017).

The importance of leases in the shipping industry can also be seen from the change in IFRS 16 'Leases', as issued by the International Accounting Standards Board (IASB) in January 2016. PWC (2016) conducted an in-depth analysis on the changes to IFRS 16 due to the impact they have on the shipping industry. They examined the new standard. They concluded that it is most likely to substantially affect the shipping industry by taking in consideration that practices and arrangements used in the shipping industry, like bareboat and time-charter contracts (as explained above) and the fact that they will be defined as a lease.

A study that was carried by the PwC Global Lease Capitalization (2015) underlined a significant average increase in debt (24%) and in EBITDA (20%) for the transport industry. While the new standard does not affect lessor accounting, it greatly affects lessees, which are the customer base of the lessors. Charter contracts were considered as operating leases without affecting the balance sheet, while charter-in hires were considered as operating expenses. This all changed with the new standard, and balance sheets must recognize the contracts. That may lead to a behavioral change in the whole industry in terms of the negotiation of new contracts.

Nam and An (2017) examined the relationship between the default risk of shipping and logistic firms in Korea using ten-year data from Korean shipping companies with good and poor financial health and comparing them. The authors discovered a significant connection between Altman K-score and firm value. In

addition, high-performance shipping firms show greater financial health when measured by the ROA than as measured by K-score. Moreover, one of the findings of the authors is that the shipping industry firms in Korea have high leverage ratios. They argue that this is partly due to the implementation of the International Financial Reporting Standards (IFRS). Specifically, shipping firms classify chartering as a capital lease and thus record the relevant liability. In turn, according to the authors, the leverage ratio of these firms increases.

Drobetz et al. (2013) examined the capital structure of globally listed shipping companies. A crucial part of the external finance of the shipping industry is debt capital (Gramenos et al, 2007). Modern and diversified financial instruments make it easier for the shipping industry to acquire the external finance needed. The authors assessed the determinants of capital structure from a global sample of publicly listed shipping firms (both active and inactive), specifically investigating if shipping firms use a target capital structure. In addition, they evaluated the adjustment dynamics and determined whether there is a deviation from that target leverage ratio. They found that the common perception about the high leverage ratios in the shipping industry is true and also that the leverage ratio is higher in relation to companies in other industries. Furthermore, the traditional capital structure affects the shipping industry, but on a different scale from other industries, proving the uniqueness of the shipping industry. Market-timing behavior and country-based variables have little information for capital structure decisions, underlining once again the global nature of the shipping industry. Moreover, the leverage is counter-cyclical in the cyclical shipping industry and, through the use of dynamic panels, they found that the adjustment speed is higher than in other industries and lower in times of economic recession. Their research finally points out that there are considerable costs of deviation from the target leverage ratio due to high finance distress costs.

Tsionas et al. (2012) explored how ownership structure affects corporate performance, utilizing a vast data sample from globally listed shipping firms and relating their financial data with the corporate structure. They found that there is a positive and bilateral correlation between concentrated ownership and performance in listed shipping firms and that the ownership structure in shipping firms does not differentiate between different markets and government structures. Finally, they found

a significant positive relation between concentrated ownership and corporate performance, with an important effect of concentrated ownership on corporate performance in the shipping industry. Moreover, as Merika et al. (2015, see also Andrikopoulos et al., 2013) note, leverage is negatively related to concentrated ownership.

Margaritis and Psillaki (2010) assessed the relationships between capital structure, ownership structure and performance. They pursued this line of investigation using a sample of French manufactures and applying a non-parametric data envelopment method in order to establish an efficiency frontier and later to find the distance of a company from that frontier. Next, the authors assessed the debt decision based on that frontier. Then with the use of a quantile regression methodology, they tested the effect that leverage has on the efficiency in order to validate the hypotheses they made about efficiency-risk and franchise-value controlling for a number of other factors. In conclusion, one of their main findings is that there is a relationship between firm efficiency and leverage. Previous studies also provide evidence of a relationship between financial performance and debt structure (Andrikopoulos et al. 2013, Corsi and Scheraga 1989, Smith 1990).

Yeo (2016) studied the aspects that affect the solvency of shipping firms by examining the financial structure of 130 shipping companies in a ten-year period. The author found a close relationship between liquidity and leverage in shipping companies. In addition, there is a conflict of interest between managers and investors due to the negative association between asset liquidity and the leverage ratio. The variables used as dependents were debt to asset, debt to equity and current debt ratio. Moreover, some of the independent variables used were tangibility, liquidity, firm size and age. Wang et al. (2017) propose the use of Bayesian inference statistical methods to predict risk in shipping companies.

Leases have been also found to relate to leverage. Chowdhury et al. (2019) examined the effects of leasing intensity on deviation from the firm's target debt ratio. The authors found that firms use leases as a source of financing when they are faced with burdens in leverage. They also identified the factors related to a more negative association between lease intensity and leverage deviation. On the other hand,

Rampini and Viswanathan (2013) estimated the rented capital of a firm using the rental expense. The authors argue that this type of lease (operating lease) is the bulk of leasing in practice. They estimated the capitalized leases by expressing rental expense as a function of total assets. Lin (2016) followed a similar approach to examine the choice between public and bank debt for a firm.

The discussion above leads to the first research hypothesis of the study regarding the effects of leases on the financial statements of shipping firms. As analyzed, the decision to lease rather than to raise capital through the markets or to borrow may have profound consequences for the performance of the firm. Moreover, we also examine the effects of the shipping crisis, set as the period 2008-2010, on the above relation. To measure performance, we use past literature and employ the return on assets ratio.

The research hypothesis is as follows:

H_1: *Leases' magnitude is positively related to the performance of shipping firms.*

and

H_2: *The positive relationship between performance and capitalized leases magnitude becomes more pronounced during the financial shipping crisis.*

3.2.3 Impairments

Impairments of non-financial assets are crucial when it comes to examining the robustness of the balance sheet. In an industry like the shipping industry, where non-financial assets are of great value (ships), the appropriate accounting approach regarding impairment is critical.

Alciatore et al. (2000) examined the impairments in oil and gas firm's assets in the period of the greatest decline in gas and oil prices with the mandatory use of the Securities and Exchange Commission (SEC) full cost ceiling test in their asset

impairments every quarter. The ceiling is calculated by firms as the present value of net cash flows from expected future production, under the assumption that the current (i.e. at the end of the quarter) oil and gas prices will prevail indefinitely. Then, the net capitalized cost of the assets must exceed the ceiling after they perform write-downs on the assets. The authors found that there is no justification for the concern of the oil and gas firms' owners about the impact that the write-downs may have on the stock returns of the firms. The reason for this is that the results of the write-downs on the stock returns happen a quarter prior to the write-downs. Moreover, the mandatory use of the full-cost ceiling test from SEC is proven to be an effective way to document the write-downs.

Loh and Tan (2002) investigated how different factors affect the asset write-off decision in Singapore, where, like in the USA, upward reevaluations are permitted. The data they used were from 78 listed firms in Singapore. The authors focused on fixed assets and long-term investments write-offs. The results of the study show that both macroeconomic factors (unemployment rate, GDP growth rate and occupancy rate of properties) and firm-specific factors (return on assets and CEO change) affect firm decision making when it comes to write-offs. Gordon and Hsu (2018) report that the impairment recognition may have different implications for future operating cash flows. Zhang et al. (2010) examined the way a unique change on the regulation of impairments affects the Chinese market. The introduction of a new CAS (Chinese Accounting Standard) that prohibits the impairment reversal gave the authors a data set that allowed them to examine how Chinese firms that used reversals as a big bath technique reacted to the measure. They document that companies with a substantial number of write-downs used reversals before the standard's effect in order to show earnings. Moreover, the research supports the implementation of the new standard as a way to counteract earnings management and finally, many managers try to use the transition period in order to manage their earnings.

Zucca and Campbell (1992) examined the write-offs and write-downs as well as the important aspects of those procedures. First, the authors searched for companies that recorded write-downs as well as the prevalence of those events. Moreover, they examined the way that discretionary write-downs are disclosed, the time that they are disclosed and if there is a time pattern. In addition, they researched the way those

write-downs affected the firm and if there was a connection to the stock price and firm performance of the firm. The authors concluded that companies tend to perform write-downs during the fourth quarter of the fiscal year as the managers understand that procedure as an unusual event. There is evidence that write-downs were used as a "big bath" and a way to manage earnings. Finally, no connection was found between write-downs stock returns and company performance as there are other economic aspects that play a key part in company performance and stock returns.

Chen et al. (2009) took advantage of the unique characteristics provided by the Chinese market to study the determinants and the consequences that may arise from the accounting discretion. They focused on the regulatory incentives provided in China regarding asset impairment reversals. From data derived from Chinese listed companies, they concluded that there are regulatory incentives that motivate Chinese listed companies to perform asset impairment reversals to avoid de-listing and trading suspension. Moreover, the authors found that there is a negative connection between earnings management regulatory motivation and the value relevance of reversal information. Finally, they concluded that an improved standard does not always lead to better reporting.

Riedl (2004) examined the impairment of long-lived assets, studying the effects of the SFAS 121 by comparing data from before and after the adoption. He found that in contrast with FASB's intentions, the SFAS 121 is used by managers as a ''big bath'' technique to cover loses and manipulate information about their performance. Moreover, the use of SFAS 121 helps decrease the write-off presentation quality. Impairments of long-lived assets and the accurate presentation of them in the financial statement of a firm are critical, especially in an industry like the shipping industry, where expensive long-lived assets are crucial for its existence and operation. Hong et al. (2018) showed that impairment losses are related to higher earnings volatility for firms implementing US GAAP compared to those implementing IFRS.

Penner et al. (2013) investigated the variation between the International Financial Reporting Standards (IFRS) and the United States Generally Accepted Accounting Principles (US GAAP) regarding asset impairment standards, especially

the impairment of long-lived assets in the shipping industry and the analogous influence they have on the financial statements analysis ratio. They established the unique characteristics of the shipping industry regarding long-lived assets and the effects the economic crisis had on the industry. They concluded that the International Financial Accounting Standards (IFRS) may lead to a price closer to the fair value of the company.

KPMG (2012) studied all the aspects and the impact of impairments on the shipping industry. The shipping industry faces a number of difficulties when it comes to impairment tests. Despite the great value of the ships, they cannot be examined separately due to the structure of the industry. In the shipping industry, ships commonly generate cash flows as a fleet, thus CGU (Cash-Generating Unit) is not a single unit but a combination of these and thus it is crucial to categorize the CGUs. A way to categorize the separate units in one cash-generating unit according to KPMG is to separate them according to revenue and assets. If the revenue is a result of the assets cooperation and if the revenue does not come from every asset separately but as a group, then this is categorized as a one GSU. The independent impairment test is only viable for specialized ships.

There are many conditions that trigger impairment according to IAS 36. For example, when the market is changed in an extreme way or the asset underperforms financially. In the shipping industry in particular, low rates and low new build ship prices can be a trigger for impairment. Moreover, a rise in scraping prices and repair rates or substantial damage to the vessel can trigger impairment. In order to execute an impairment test, one should take into account if the asset brings profit by selling or by operating it. If the asset falls under the second category then it must be written down. The fair value of the asset must be evaluated through the market and the operating value of the asset is calculated by future cash flows or GSU. For the calculation of the value in use (operating value), the composition of the cash flow and the discount rate must be examined. The operating value and the fair value are similar, but due to the market, the operating value may appear higher. Another issue that came up due to the economic crisis is that the construction costs of the ship may end up higher than the fair value of the ship. If this is the case, then impairment is necessary. In addition, if the receivable or CGU is boosted then the impairment must be reversed.

Finally, when it comes to disclosing under IAS 36, the CGUs and whether the origin of the receivable is from fair or operating value must be clarified.

Thus, the research hypothesis that emerges regarding the use of impairments for shipping firms relates to certain firm characteristics that affect the recording of an impairment. In this respect, firm size, operating performance (as measured by *ROE*), growth options (as measured by the *BtM* ratio) and leverage are related to the recognition of an impairment. The relevant research hypothesis is as follows:

H_3: *The recognition of impairment is positively related to size, and negatively related to BtM, ROE and leverage ratios.*

3.2.4 Revenue and Expenses Recognition

Duru et al. (2017) argue for the differences between cost-based and time-based revenue recognition practices in the shipping industry and recommend the cost-based approach in combination with the performance obligation as it is used in general accounting practices. They found that there is a chasm when it comes to cost-based and time-based recognition and that the cost-based approach, despite the difficulties it can introduce in the beginning due to the industry's uniqueness, quickens the revenue recognition in favor of the ship owner. Finally, the cost-based approach, as implemented by the Financial Accounting Standards Board (FASB) and the International Financial Reporting Board (IASB), makes the comparison between corporations and industries easier.

Armstrong et al. (2010) researched sixteen events that followed the adoption of the International Financial Reporting Standards (IFRS) and the impact they had on the stock market in the European Union. The adaptation of IFRS, despite the controversy that emerged between governments, led to the unification of the Reporting Standards not only in the European Union but throughout the world. It is important to examine the effects that the IFRS adoption had on the stock market. Companies with both good and asymmetrical information quality welcomed the adaptation and implementation of the IFRS, and only in companies situated in countries with civil law did the adaptation have negative impact on the investors. The

reaction to the IFRS adaptation is critical in the shipping industry due to its complexity and multi-nationality.

Horton et al. (2013) studied the effects that the forced implementation of International Financial Reporting Standards (IFRS) have on the information provided from firms. Firms that are obligated to adopt the IFRS show a decrease in forecast errors. Moreover, the quality of the information generated using the IFRS creates a better information environment for the market. The quantity and the quality of the information provided by the Financial Statements helps investors and management to better understand the firms. The shipping industry, situated in an "ever-changing tide", needs better information in order to thrive.

Daske et al. (2008) examined the results of the obligatory use of International Financial Reporting Standards (IFRS) reporting in the global economies. They examined market liquidity, cost of capital and Tobin's q in a large number of companies from 26 countries were IFRS adaptation is legally forced. They concluded that there was a rise of the market liquidity during the adaptation period as well as a boost in companies' equity valuation and a decline in capital cost. Moreover, in countries where legal enforcement is loose and there are no inducements for being transparent, there are no gains in the capital market from obligatory adaptation.

Jeanjean and Stolowy (2008) studied the results on earnings quality and earnings management from the obligatory adaptation of the International Financial Reporting Standards (IFRS). They focused on Australia, France and the UK, where despite the obligatory adoption of IFRS, the popularity of earning management did not decrease and in France's case it increased. In conclusion, according to the authors, there is a great need for more incentives and a better organized institutional structure in addition to the worldwide convergence of reporting standards in order for the reporting quality and the information given to improve.

Lantto and Sahlstrom (2009) examined the results of the implementation of the International Financial Reporting Standards (IFRS) on key financial ratios. Their sample came from a European country (Finland). Firstly, they made a database consisting of companies' financial statements under national accounting principles

and then IFRS. After that, they completed the database and found differences in key financial ratios; finally, they researched the reasons why adopting IFRS led to the differences. They concluded that the modifications in the key accounting ratios are a result of the implementation of fair value accounting, lease accounting and income tax accounting principles in addition to financial instruments guidelines.

Barth et al. (2008) examined the correlation between the implementation of International Accounting Standards (IAS) and accounting quality. Firms that implement IAS demonstrate less earnings manipulation and an increase in the time loss recognition and value importance of accounting amounts. The result of the implementation as the study was a high-quality level of information compared to the period before IAS implementation.

Moreover, a new revenue recognition standard was issued from the International Accounting Standard Board (IASB), IFRS 15 Revenue from Contracts with Customers. PricewaterhouseCoopers conducted an in-depth analysis regarding the changes in IFRS 15. The standard became mandatory in 2018. IFRS 15 affects every company in different ways. The industry of greatest interest to this study is the transport and logistics industry. The increase in revenue from contracts to provide goods and services means that it falls into IFRS 15, but only if another Standard is not in place (leases). Lease contracts may provide other services in addition to the lease contract, thus the separation from the company is imperative for each contract. This will lead to a different approach from firms when it comes to the calculation and perception of revenue.

Furthermore, if the components of a contract and/or the contract as a whole fall into IFRS 15, then a further discussion arises in order for the revenue to be recognized. There are five steps that must be taken into account when it comes to revenue recognition under IFRS 15. Firstly, it is essential to recognize the contract and whether that contract is substantive and creates revenue. To continue, many firms in transportation, including shipping companies, provide a plethora of goods and services on a single contract. Companies should now assess the different performance obligations within a contract and consider them as a single obligation only on certain occasions. Then they need to determine the transaction price and then allocate it.

Many transportation and logistics companies provide many goods in one contract, thus a price must be allocated for every performance obligation. In the end, the revenue must be recognized. Revenue recognition is important for transportation companies due to the fact that providing their services takes time. In conclusion, the disclosure requirements will broaden and this will lead to a future where many things must be taken into account by a variety of companies.

Van Tendenloo and Vanstraelen (2005) addressed whether the adoption of high-quality reporting standards helps in lowering the use of earnings management policies, especially in a country like Germany, where there are low investor protection rights and they have a code of law. In order to do so, they compared listed companies in Germany that report either under International Financial Reporting Standards or German GAAP. The results imply that there is no observable difference in the firms' behavior relating to earnings management in correlation to their choice of reporting. Thus, the authors argue that in countries with low investor protection rights, high-quality reporting standards are not capable of controlling earnings management behaviors on their own.

Iatridis (2010) examined whether the adoption of IFRS in the UK and the switch from UK GAAP to IFRS led to higher quality accounting numbers. Moreover, in order to establish the potentiality of earnings management under IFRS, the author tested company accounting measures reported under IFRS and UK GAAP. The agency theory that the author adopted was used in order to help predict the managers' behavior. The UK, a country with common law and strong investor protection policies, is suitable environment to test the transition from UK GAAP to IFRS and how that transition affects earnings management behavior. The study concluded that in high-quality standard reporting environment with the use of IFRS, the potentiality for earnings management is lesser.

Roychowdhury (2006) examined earnings management but with evidence provided by the operational activities of a company. The author discovered that managers use price discounts, overproduction and discretionary expenditure reduction in order to present better financial data or achieve their annual targets (although there were no robust data to prove that). With the use of cross-sectional analysis, the author

established that sophisticated investors may spot real-operations earnings management. Moreover, the author found that stock inventories and receivables, industry membership and incentives to meet zero earnings are factors that influence real activities manipulation.

Based on the discussion above, the relevant research hypotheses are as follows:

H4: *The level of accrual-based earnings management of shipping firms is related to the size and the performance of the shipping firm.*

Given the importance of impairments for the capital structure of a firm, the fifth research hypothesis regards the relationship between impairments and earnings management. Specifically, we argue that shipping firms, due to the high leverage ratios, may attempt to provide a better financial picture by using asset impairments on a discretionary basis. Thus, the fifth research hypothesis is as follows:

H5: *The level of accrual-based earnings management of shipping firms is affected by the impairment losses magnitude.*

3.3 The Models and Research Methodology

The research methodology of the present chapter begins with the estimation of the accrual-based earnings management measure. For the task in hand, we follow Jones (1991) and Dechow et al. (1995) as well as Andreou et al. (2014) and estimate the following cross-sectional model using OLS for all firms in every year:

$$Accruals_i = \alpha_0 + \alpha_1(\Delta SALES_i - \Delta ACC\_REC_i) + \alpha_2 PPE_i + \alpha_3 OCF_i + \alpha_4 BtM_i + \omega_i \quad (3.1)$$

where *Accruals* is the difference between net income and operating cash flows deflated by the lag of total assets, ΔSAL is the change in total revenues deflated by the lag of total assets, ΔACC_REC is the change in accounts receivable deflated by the lag of total assets, *PPE* is the property plant and equipment deflated by the lag of total

assets, *OCF* is the ratio of operating cash flows to the lag of total assets, and *BtM* is the book to market ratio.

For the main models, we use the discretionary accruals (denoted as *DA*), estimated as the value of the residuals of the model of eq. (3.1) estimated for each year; the positive discretionary accruals (denoted as *Positive_DA*), which is a variable equal to the estimated residuals of the model of eq. (3.1) if they have a positive value and zero otherwise; and the negative discretionary accruals (denoted as *Negative_DA*), which is a variable equal to the estimated residuals of the model of eq. (3.1) if they have a negative value and zero otherwise. As Durnev et al. (2016b) argue, positive accruals are related mainly to decreases in financial reporting quality. For brevity, we use in the equations the term *EM_PROXY* for each one of these variables. Most of the models are estimated using period and regional fixed effects.

After estimating the discretionary accruals and based on Van Tendenloo and Vanstraelen (2005), we use the following model to examine the factors associated with discretionary accruals (H_3 and H_4) for shipping firms as well as any incremental effects for firms implementing accounting standards that are similar to the IFRS or largely comply with the IFRS:

$$\begin{aligned} DA_{i,t} = {} & \beta_0 + \beta_1 Size_{i,t} + \beta_2 \,\mathrm{Tan}\, gibility\_Ratio_{i,t} + \beta_3 Cash\_Ratio_{i,t} \\ & + \beta_4 ROE_{i,t} + \beta_5 Leverage_{i,t} + \beta_6 IFRS_{i,t} \\ & + \beta_7 IFRS_{i,t} \times Size_{i,t} + \beta_8 IFRS_{i,t} \times \mathrm{Tan}\, gibility\_Ratio_{i,t} \\ & + \beta_9 IFRS_{i,t} \times Cash\_Ratio_{i,t} + \beta_{10} IFRS_{i,t} \times ROE_{i,t} \\ & + \beta_{11} IFRS_{i,t} \times Leverage_{i,t} + \upsilon_{i,t} \end{aligned} \tag{3.2}$$

where *Size* is the logarithm of total assets (following Drobetz et al., 2014), *Tangibility_Ratio* is the ratio of *PPE* to the lag of total assets, *Cash_Ratio* is the ratio of cash and cash equivalents to the lag of total assets, *ROE* is the return on equity ratio, and *Leverage* is the ratio of short- and long-term debt to total assets. Moreover, *IFRS* is a binary variable taking the value of one if the firm is domiciled in a country where the accounting standards have converged to IFRS and zero otherwise. Eq. (3.2) is used to test research hypothesis H_4 using coefficients β_1, β_4 as well as the cross-

terms with IFRS (coefficients β_7 and β_{10}). The model is estimated using OLS with robust standard errors and period and regional fixed effects.

To examine research hypothesis H_5, we use a model expressing discretionary accruals as a function of firm characteristics and asset impairments as follows:

$$\begin{aligned} DA_{i,t} = {} & \beta_0 + \beta_1 Size_{i,t} + \beta_2 \text{Tan}\, gibility\_Ratio_{i,t} + \beta_3 Cash\_Ratio_{i,t} \\ & + \beta_4 ROE_{i,t} + \beta_5 Leverage_{i,t} + \beta_6 \text{Im}\, pairment_{i,t} + \upsilon_{i,t} \end{aligned} \tag{3.3}$$

where *Impairment* is the pre-tax write-down multiplied by minus one (in order to make it positive number) and divided by the lag of total assets, and the rest of the variables are as defined in eq. (3.2). The coefficient of interest is β_6. We also estimate a version of eq. (3.3) using a number of intercept and slope dummy variables to measure the effects of the recognition of impairment losses on the relationship between discretionary accruals and the rest of the independent variables in eq. (3.3); the model is as follows:

$$\begin{aligned} DA_{i,t} = {} & \beta_0 + \beta_1 Size_{i,t} + \beta_2 \text{Tan}\, gibility\_Ratio_{i,t} + \beta_3 Cash\_Ratio_{i,t} \\ & + \beta_4 ROE_{i,t} + \beta_5 Leverage_{i,t} + \beta_6 High\_\text{Im}\, p_{i,t} \\ & + \beta_7 High\_\text{Im}\, p_{i,t} \times Size_{i,t} + \beta_8 High\_\text{Im}\, p_{i,t} \times \text{Tan}\, gibility\_Ratio_{i,t} \\ & + \beta_9 High\_\text{Im}\, p_{i,t} \times Cash\_Ratio_{i,t} + \beta_{10} High\_\text{Im}\, p_{i,t} \times ROE_{i,t} \\ & + \beta_{11} High\_\text{Im}\, p_{i,t} \times Leverage_{i,t} \\ & + \upsilon_{i,t} \end{aligned} \tag{3.4}$$

where *High_Imp* is a binary variable taking the value of one if the firm is grouped in the higher 50% of firms based on the magnitude of *Impairment* and zero otherwise It should be noted that due to data unavailability regarding impairments in Compustat Global, we estimate the model of eq. (3.3) and (3.4) using a sample of US firms from Compustat North America to examine research hypothesis H_5. The models are estimated using OLS with robust standard errors and period fixed effects.

Moreover, to provide further evidence, we also examine the determinants of recording high asset impairment losses using a logit model of the following form:

$$High\_\mathrm{Im}p_{i,t} = \beta_0 + \beta_1 Size_{i,t} + \beta_2 \mathrm{Tan}gibility\_Ratio_{i,t} + \beta_3 Cash\_Ratio_{i,t} + \beta_4 ROE_{i,t} + \beta_5 Leverage_{i,t} + \beta_6 BtM_{i,t} + \upsilon_{i,t} \quad (3.5)$$

All other variables are as defined above. We use the model of eq. (3.5) to assess the validity of research hypothesis H_3 through the magnitude and significance of coefficients β_1, β_4, β_5 and β_6. Moreover, the model is estimated using logit regression.

The next model helps in assessing the operating performance of shipping firms in relation to the determinants. The model is as follows:

$$EBITDA\_\mathrm{Pr}e\,\mathrm{Re}nt_{i,t} = \beta_0 + \beta_1 Leverage_{i,t} + \beta_2 \mathrm{Tan}gibility\_Ratio_{i,t} + \beta_3 BtM_{i,t} + \beta_4 Size_{i,t} + \beta_5 Cap\_\mathrm{Re}nt_{i,t} + \upsilon_{i,t} \quad (3.6)$$

where *EBITDA_PreRent* is EBIDTA plus rental expense, *Cap_Rent* is the estimate of capitalized leases, estimated following Lin (2016) as rental expense multiplied by ten and divided by the lag of total assets, and all other variables are as defined above. The model of eq. (3.6) is used to assess the validity of research hypothesis H_1. The model is estimated using OLS with robust standard errors and regional and period fixed effects.

We also estimate a model based on Eq. (3.6) to examine the effects of the shipping crisis on the relationship between capitalized leases and firm performance as follows:

$$EBITDA\_\mathrm{Pr}e\,\mathrm{Re}nt_{i,t} = \beta_0 + \beta_1 Leverage_{i,t} + \beta_2 \mathrm{Tan}gibility\_Ratio_{i,t} + \beta_3 BtM_{i,t} + \beta_4 Size_{i,t} + \beta_5 Cap\_\mathrm{Re}nt_{i,t} + \beta_6 Crisis_{i,t} + \beta_7 Crisis_{i,t} \times Cap\_\mathrm{Re}nt_{i,t} + \upsilon_{i,t} \quad (3.7)$$

where *Crisis* is a binary variable taking a value of 1 for the shipping crisis period (2008-2010) and zero otherwise, and all other variables are as defined above. Eq. (3.7) is used to examine the validity of research hypothesis H_2 through coefficient β_5. The model is estimated using OLS with robust standard errors and regional effects.

3.4 Sample Description

The sample comes from Compustat Global and Compustat North America. It includes firms from a number of different countries, as reported in Table 3.1. The primary sample includes all firms with SIC codes 4400 and 4412 and covers the period 1987-2018. All variables are expressed in GBP following the translation procedure of WRDS. All continuous variables are examined for extreme observations and these are deleted at the upper and lower 1% of the distribution of each variable. Moreover, we delete observations for firm years where the book value of equity has negative values to avoid any issues of extreme negative performance. Lastly, following Drobetz et al. (2013), we manually exclude firms that do not possess or/and operate ships in order to keep in the sample exclusive to firms operating ships.

Table 3.1 presents the descriptive statistics and is divided into two Panels. Panel A presents the descriptive statistics for the international sample, while Panel B presents the results for the US sample. A number of points are worth noting. First, there is no presence of extreme observations, likely due to the deletion filter applied. Second, the shipping firms of both samples keep a high amount of cash, as can be seen by the respective variables. Third, the leverage ratios are also high, as expected due to the shipping industry's characteristics.

Table 3.2 presents the correlation matrix and is also divided into two sub-parts, i.e. Panel A for the international sample and Panel B for the US sample. The correlation coefficient shows that there is no likely evidence of multicollinearity.

Table 3.1: Descriptive Statistics

Panel A: International Sample					
	Mean	Median	Maximum	Minimum	Std. Dev.
ABSOLUTE_DA	0.039	0.027	0.215	0.000	0.037
POSITIVE_DA	0.020	0.002	0.189	0.000	0.032
NEGATIVE_DA	-0.019	0.000	0.000	-0.215	0.033
EBITDA_PreRent	0.112	0.098	0.754	-0.182	0.096
ROE	0.018	0.059	1.336	-3.254	0.310
CASH	0.096	0.065	0.581	0.000	0.097
LEVERAGE	0.389	0.399	0.914	0.000	0.205
TANGIBILITY	0.671	0.689	2.056	0.000	0.302
BTM	1.187	0.900	11.237	0.000	1.148
SIZE	5.777	5.809	9.510	1.352	1.496
CAP_RENTAL	0.093	0.000	4.789	0.000	0.329
CRISIS	0.163	0.000	1.000	0.000	0.369
Panel B: US Sample					
	Mean	Median	Maximum	Minimum	Std. Dev.
ABSOLUTE_DA	0.036	0.022	0.284	0.000	0.041
POSITIVE_DA	0.019	0.009	0.126	0.000	0.026
NEGATIVE_DA	-0.017	0.000	0.000	-0.284	0.041
SIZE	7.287	7.435	9.894	4.163	1.115
TANGIBILITY	0.862	0.853	3.162	0.079	0.315
CASH	0.060	0.049	0.282	0.000	0.047
ROE	-0.050	0.021	0.686	-3.807	0.371
LEVERAGE	0.464	0.472	0.850	0.000	0.153
BTM	1.013	0.761	9.182	0.022	0.957
IMP	0.002	0.000	0.212	-0.006	0.015

Notes: Panel A presents the descriptive statistics for the international sample, while Panel B presents the descriptive statistics for the US sample. Both samples are drawn from Compustat (Global and North America, respectively). The variables' descriptions are presented in Appendix A.

3.5 Empirical Results

3.5.1 Earnings Quality and IFRS for Shipping Firms

Table 3.2: Correlation Matrix

Panel A: International Sample

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
ABSOLUTE_DA	1.000										
POSITIVE_DA	0.534***	1.000									
NEGATIVE_DA	-0.597***	0.359***	1.000								
EBITDA_PreRent	-0.043**	0.080***	0.123***	1.000							
ROE	-0.239***	0.279***	0.528***	0.363***	1.000						
CASH	0.075***	0.142***	0.052**	0.130***	0.121***	1.000					
LEVERAGE	-0.125***	-0.299***	-0.147***	-0.097***	-0.233***	-0.334***	1.000				
TANGIBILITY	-0.161***	-0.255***	-0.065***	0.227***	0.014	-0.294***	0.483***	1.000			
BTM	0.038*	0.015	-0.027	0.174***	0.114***	0.104***	0.008	-0.049**	1.000		
SIZE	-0.217***	-0.077***	0.167***	-0.006	0.021	-0.095***	0.228***	0.143***	-0.026**	1.000	
CAP_RENTAL	0.025	0.011	-0.017	0.523***	-0.010	0.045**	-0.057***	-0.023	-0.012***	0.107***	1.000

Panel B: US Sample

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
ABSOLUTE_DA	1.000									
POSITIVE_DA	0.313***	1.000								
NEGATIVE_DA	-0.805***	0.310***	1.000							
SIZE	-0.310***	-0.156***	0.213***	1.000						
TANGIBILITY	-0.252***	-0.101**	0.189***	-0.061	1.000					

CASH	0.002	0.070	0.042	-0.084	0.015	1.000				
ROE	-0.522***	0.189***	0.640***	0.295***	0.192***	0.021	1.000			
LEVERAGE	-0.103**	-0.224***	-0.037	0.194***	0.084	-0.279***	-0.167***	1.000		
BTM	-0.108**	-0.121**	0.033	0.218***	-0.032	-0.053	0.129**	0.157***	1.000	
IMP	0.268***	-0.081	-0.319***	-0.086*	-0.058	-0.047	-0.185***	-0.039	-0.071	1.000

Notes: Panel A presents the descriptive statistics for the international sample, while Panel B presents the descriptive statistics for the US sample. Both samples are drawn from Compustat (Global and North America, respectively). Variables' descriptions are presented in Appendix A. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels.

The analysis of the empirical results starts with the examination of the research hypotheses regarding the use of earnings management by shipping firms as well as the effects of IFRS. We first estimate eq. (3.1) for each year and save the residuals as the proxy for discretionary accruals. Then, we estimate eq. (3.2) and report the results in Table 3.3. The aim is to assess the determinants of shipping firms' earnings quality using various forms of discretionary accruals (absolute, positive or negative) to proxy for financial quality. We base our estimation on the international sample in order to be able to examine the effects of IFRS.

The results of Panel A indicate that size is negatively related to absolute discretionary accruals. This result is further examined based on Panels B (positive discretionary accruals) and C (negative discretionary accruals), where it can be seen that the bigger the maritime firm, the lower (higher) the positive (negative) discretionary accruals.

Table 3.3: Earnings Quality, Shipping Firms and IFRS

	Panel A: Absolute DA		*Panel B: Positive DA*		*Panel C: Negative DA*	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
INTERCEPT	0.076***	12.448	0.043***	7.613	-0.029***	-6.292
SIZE	-0.005***	-7.713	-0.002**	-2.448	0.003***	5.200
TANGIBILITY	-0.011**	-2.028	-0.014***	-3.309	-0.007	-1.572
CASH	-0.016	-1.331	-0.002	-0.134	-0.004	-0.411
ROE	-0.005	-1.192	0.029***	6.255	0.056***	8.063
LEVERAGE	-0.005	-0.774	-0.022***	-3.944	-0.011**	-2.086
IFRS	0.015*	1.688	0.001	0.089	-0.013*	-1.729
IFRSxSIZE	-0.001	-0.514	0.001	1.141	0.001	1.163
IFRSxTANGIBILITY	-0.014*	-1.741	-0.009	-1.461	-0.002	-0.321
IFRSxCASH	0.025	1.161	0.005	0.281	-0.008	-0.462
IFRSxROE	-0.012*	-1.721	0.000	-0.037	0.010	0.999
IFRSxLEVERAGE	0.004	0.360	0.001	0.056	0.015*	1.951
Period Effects	Included		Included		Included	
Regional Effects	Included		Included		Included	
Observations	2458		2458		2458	
Firms	267		267		267	
Adj. R^2	0.107		0.192		0.351	

Notes: The sample is drawn from Compustat Global. The variables' descriptions are presented in Appendix A. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels.

This result implies that bigger maritime firms have less positive discretionary accruals and this may be attributed to the higher financing needs of these firms. Specifically, the higher needs of these firms in terms of financing may lead them to attempt to increase their financial reporting quality in order to attract more capital through financial markets. This assertion is reinforced from the coefficient of leverage in Panel B, which is negative and significant at the 1% level (the respective coefficient is also significant and negative in Panel C). This implies that the more leveraged the firm, the lower the earnings management level, and this stems mainly from a very significant negative relationship between leverage and positive accruals.

Tangibility is negative and significant in Panels A and B but insignificant in the third panel. Moreover, the negative relationship between tangibility and discretionary accruals is supported by the sign of the coefficients of tangibility. This result shows that the higher the fraction of the tangible assets of a shipping firm, the lower the absolute or positive discretionary accruals. In contrast, return on equity is insignificant in Panel A but significant with a positive coefficient for negative and positive accruals; however, this effect is more pronounced for negative accruals.

The IFRS dummy is significant for negative accruals and marginally significant for absolute accruals, while from the cross-terms of IFRS with the other variables, only those with *ROE* and *TANGIBILITY* are significant and negative in Panel A, while *LEVERAGE* is also significant and positive in Panel C. This result implies that the higher the performance of maritime firms incorporated in countries where the accounting standards have converged to IFRS, the higher the earnings quality. Based on the above, the results provide support to H_4. Moreover, as a robustness check and to examine if endogeneity affects the results, we re-estimate the models using *ROE* and *LEVERAGE* with a lag. The results (unreported but available) show that our main conclusions do not change.

3.5.2 Impairment Loss Recognition

Next, we move on to examine the effects of recognizing impairment losses. To examine the recognition of impairments, we use the sample of US firms as compiled using the Compustat North America database. Table 3.4 presents the results of the estimation of eq.

(3.5) regarding the determinants of impairment loss recognition. The logit model estimated shows that size is positively related to the likelihood of recognizing a high impairment loss.

This result implies that larger firms disclose more negative news about their long-lived assets at a higher rate in relation to smaller shipping firms and this is likely related to the fact that larger firms are more visible to investors. In turn, these firms are more conditionally conservative in an effort to increase financial reporting quality and thus have a higher likelihood of disclosing bad news in relation to good news through their financial statements due to a higher litigation risk (Ball and Shivakumar, 2005).

Table 3.4: Determinants of Impairment Loss Recognition of Shipping Firms

	Coefficient	z-Statistic	Prob.
INTERCEPT	-4.937***	-4.176	0.000
SIZE	0.522***	3.183	0.002
TANGIBILITY	0.204	0.427	0.670
CASH_LIQUIDITY	-6.069	-1.185	0.236
ROE	-1.215***	-3.620	0.000
LEVERAGE	-2.998**	-2.199	0.028
BTM	-0.471*	-1.745	0.081
Observations	441		
Firms	70		
McFaddenR^2	0.072		

Notes: The sample is drawn from Compustat North America. The variables' descriptions are presented in Appendix A. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels.

ROE has a negative and significant coefficient, which shows that the better the performance of the firm, the lower the likelihood of recognizing an impairment. This result is in agreement with Zucca and Campbell (1992; Loh and Tan, 2002). Leverage is also negatively related to the likelihood of an impairment and this result is in agreement with Loh and Tan (2002). The negative *LEVERAGE* coefficient implies that the higher the leverage of a

firm, the less likely that it will recognize an impairment likely due to the higher risk of highly leveraged firms.

Table 3.5: Earnings Quality, Shipping Firms and High Asset Impairments

	Panel A: Absolute DA		*Panel B: Positive DA*		*Panel C: Negative DA*	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
INTERCEPT	0.108***	5.907	0.075***	7.305	-0.033**	-2.025
SIZE	-0.005***	-2.870	-0.005***	-4.519	0.001	0.322
TANGIBILITY	-0.019**	-2.513	-0.011	-1.359	0.009**	2.085
CASH	-0.043	-1.054	-0.004	-0.109	0.039	1.132
ROE	-0.049***	-4.181	0.017***	3.811	0.066***	4.458
LEVERAGE	-0.037***	-2.692	-0.023	-1.472	0.015	1.286
IMPAIRMENT	0.417***	2.719	-0.137**	-2.407	-0.553***	-4.558
Period Effects	Included		Included		Included	
Observations	386		386		386	
Firms	66		66		66	
Adj. R^2	0.382		0.163		0.451	

Notes: The sample is drawn from Compustat North America. The variables' descriptions are presented in Appendix A. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels.

As Loh and Tan (2002) argue, such firms likely do not recognize an impairment as they are trying to avoid further deterioration of the financial position of the firm. Lastly, the *BtM* ratio has also a negative and significant coefficient. The likely explanation is that high *BtM* firms are more likely to be near financial distress and thus avoid recognizing an impairment loss that would further drive its financial position lower. Thus, our findings provide support to research hypothesis H_3.

To further examine the recognition of impairments by a firm, we estimate the model of eq. (3.3) and (3.4), and the results are provided in Tables 3.5 and 3.6. Panels A-C present the results of the estimation of eq. (3) using absolute discretionary accruals and positive and negative discretionary accruals, respectively. The variable of interest is *IMPAIRMENT*. As can be seen, the respective coefficient is positive and significant, which implies that the higher the amount of the impairment, the lower the earnings quality. On the contrary, the coefficient of

IMPAIRMENT is negative in both Panels B and C. Considering that the impairments variable is coded as a positive value, the higher negative coefficient is as expected for Panel C. These results likely imply that impairments are related to some extent to negative discretionary accruals for shipping firms.

To provide further evidence on this matter, we estimate eq. (3.4) and report the results in Panels A-C of Table 3.6. The results show that shipping firms that record impairments have lower positive and negative discretionary accruals. Moreover, larger firms that record impairments have higher positive and negative discretionary accruals. On the contrary, more profitable firms that record impairments are related to higher negative discretionary accruals.

Table 3.6: Earnings Quality, Shipping Firms and High Asset Impairments

	Panel A: Absolute DA		*Panel B: Positive DA*		*Panel C: Negative DA*	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
INTERCEPT	0.109***	6.165	0.077***	7.577	-0.033***	-2.023
SIZE	-0.005***	-2.723	-0.005***	-4.204	0.000	0.041
TANGIBILITY	-0.020***	-2.618	-0.011	-1.317	0.010**	2.300
CASH	-0.034	-0.808	-0.002	-0.051	0.032	0.878
ROE	-0.045***	-3.308	0.018***	3.684	0.063***	3.636
LEVERAGE	-0.044***	-3.284	-0.024	-1.481	0.019	1.603
HIGH_IMP	0.004	0.078	-0.086***	-3.212	-0.090*	-1.669
HIGH_IMPxSIZE	-0.005	-0.896	0.009**	2.220	0.014***	2.617
HIGH_IMPxTANGIBILITY	0.032**	1.987	0.006	0.516	-0.026	-1.603
HIGH_IMPxCASH_LIQUIDITY	-0.164	-1.331	-0.066	-0.776	0.098	0.958
HIGH_IMPxROE	-0.049***	-3.144	-0.009	-1.159	0.040***	2.591
HIGH_IMPxLEVERAGE	0.015	0.377	0.020	0.621	0.005	0.132
Period Effects	Included		Included		Included	
Observations	386		386		386	
Firms	66		66		66	
Adj. R^2	0.383		0.162		0.439	

Notes: The sample is drawn from Compustat North America. The variables' descriptions are presented in Appendix A. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels.

Moreover, the results in Panel A reveal a positive relationship between the tangibility ratio and absolute discretionary accruals for firms recognizing asset impairments. This result likely provides support to the contention that the high degree of tangible assets that shipping firms have may lead to a higher likelihood of discretionary use of asset impairments. Thus, the results seem to support research hypothesis H_5.

3.5.3 Leases and Firm Performance

Table 3.7 presents the results of the estimation of eq. (3.6), which aims to uncover any effects of capitalized leases on shipping firms' performance. As described in section 3.3, we use the methodology of Lin (2016) to estimate the capitalized leases proxy. The results in Panel A of Table 3.7 reveal that the level of capitalized rental expense has a positive and highly significant coefficient. This result shows that the higher the level of capitalized leases for a shipping firm, the higher its performance.

Table 3.7: Effects of Capitalized Leases on Firm Performance

Panel A: Capitalized Rental Expense			Panel B: Capitalized Rents and the Crisis		
	Coefficient	t-Statistic		Coefficient	t-Statistic
INTERCEPT	0.046***	3.025	INTERCEPT	0.047***	3.211
LEVERAGE	-0.107***	-7.147	LEVERAGE	-0.118***	-7.435
TANGIBILITY	0.122***	11.531	TANGIBILITY	0.128***	11.893
BTMDUM	0.013***	5.302	BTM	0.016***	6.526
SIZE	0.000	-0.103	SIZE	-0.001	-0.426
CAP_RENTAL	0.155***	17.596	CAP_RENTAL	0.142***	13.412
			CRISIS	-0.007	-1.534
			CRISISxCAP_RENTAL	0.043***	3.578
Period Effects	Included		Period Effects	Not Included	
Regional Effects	Included		Regional Effects	Included	
Observations	2,842		Observations	2,842	
Firms	272		Firms	272	
Adj. R^2	0.437		Adj. R^2	0.381	

Notes: The sample is drawn from Compustat Global. The variables' descriptions are presented in Appendix A. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels.

Moreover, in Panel B of the table where the results of the estimation of eq. (3.7) are tabulated, the aforementioned variable has also a positive and significant coefficient, but more importantly, the cross term between the *Crisis* and the capitalized leases variables (*CRISISxCAP_RENTAL*) has a positive and significant coefficient. This result shows that the higher the capitalized rental expenses during the shipping crisis, the higher the performance of the firm. Therefore, these results provide support to research hypotheses H_1 and H_2 by showing that shipping firms with higher rental expenses have better operating performance and this effect was more pronounced during the shipping crisis.

3.6 Conclusions

The present chapter examined specialized accounting issues regarding shipping firms. The implementation of the empirical models was based on two samples, one coming from Compustat Global (denoted as the international sample) and one for US shipping firms (denoted as the US sample). The reason for the two samples is that Compustat reports impairments only in the North America database, and as the research hypotheses regarding impairments needed to be examined, we used two different samples.

The results of the empirical analysis regarding discretionary accruals show that bigger maritime firms have less positive discretionary accruals, and this may be attributed to the higher financing needs of these firms. More specifically, the higher needs of these firms in financing may lead them to attempt to increase their financial reporting quality in order to attract more capital through financial markets. Moreover, we also find that the higher the performance of maritime firms incorporated in countries where the accounting standards have converged to IFRS, the higher the earnings quality, while the fraction of the tangible assets of a shipping firm is negatively related to positive or negative discretionary accruals. On the contrary, return on equity is negatively related to absolute discretionary accruals. Overall, the analysis on the relationship between the shipping firm characteristics and the various proxies of discretionary accruals is in agreement with the research hypotheses of the chapter.

We also examined the determinants of impairment loss recognition for the sample of the US firms and showed that larger shipping firms disclose negative news about their long-lived assets at a higher rate than smaller shipping firms. This is likely related to the fact that

larger firms are more visible to investors. Further tests show that impairments are likely related to some extent to negative discretionary accruals for shipping firms. These results support the contention that the high degree of tangible assets that shipping firms have may lead to a higher likelihood of discretionary use of asset impairments.

Lastly, we examined the relationship between operating leases and performance for the shipping industry. Using a proxy for capitalized leases, we find that this variable is positively related to firm performance, and this effect was even more positive during the shipping crisis of 2008-2010. These results also provide support to the relative research hypotheses.

The results should be useful for academics, regulators and practitioners due in showing that shipping firms have distinctive characteristics that can impact on earnings quality and the information content of financial statements. As explained above, decreasing information asymmetry is a crucial condition for shipping firms due to the high funding needs in maintaining operations and the shipping fleet. Thus, the analysis of this chapter should be useful in identifying the conditions under which information asymmetry decreases and the quality of the information in the financial statements of a shipping firm increases.

Appendix A: Variables' Definitions

Variable	***Definition***
Accruals	The difference between net income and operating cash flows deflated by the lag of total assets
ΔSAL	The change in total revenues deflated by the lag of total assets
ΔACC_REC	The change in accounts receivable deflated by the lag of total assets
PPE	The property plant and equipment deflated by the lag of total assets
OCF	The ratio of operating cash flows to the lag of total assets
BtM	The book to market ratio
ABSOLUTE_DA	The discretionary accruals estimated as the value of the residuals of the model of eq. (3.1).
POSITIVE_DA	The positive discretionary accruals, which equals the discretionary accruals if they are positive and zero otherwise.
NEGATIVE_DA	The negative discretionary accruals, which equals the discretionary accruals if they are negative and zero otherwise.
TANGIBILITY_RATIO	The ratio of PPE to the lag of total assets.
CASH_RATIO	The ratio of cash and cash equivalents to the lag of total assets.
BtM	The book to market ratio.
ROE	The return on equity ratio.
LEVERAGE	The ratio of short and long-term debt to total assets.
CAP_RENT	The estimate of capitalized leases estimated following Lin (2016) as rental expense multiplied by ten and divided by the lag of total assets.
IFRS	A binary variable that takes the value of one if the firm is domiciled in a country where the accounting standards have converged to the IFRS and zero otherwise.
IMPAIRMENT	The impairment loss (coded as a positive number) divided by the lag of total assets.
EBITDA_PRERENT	The EBIDTA plus rental expense.

HIGH_IMP	A binary variable taking the value of one if the firms is grouped at the higher 50% of firms based on the magnitude of *Impairment* and zero otherwise.
CRISIS	A binary variable taking a value of 1 for the shipping crisis period (2008-2010) and zero otherwise.

CHAPTER 4

Offshore Financial Centers, Earnings Management and Maritime Companies

4.1 Introduction

This chapter examines how the choice of the place of incorporation affects the level of financial reporting quality of shipping firms. The methodology builds on previous studies that reported three main characteristics related to OFCs, namely low tax rates,[1] flexible regulation and high financial secrecy. These three characteristics, as well as their contemporaneous effects, may lead to differences in the overall profiles of the OFCs (Durnev et al., 2016, 2017).

However, these factors and their interrelations may also affect a firms' financial reporting quality. Hence, the scope of this chapter is to examine if and to what extent these three characteristics have any differential effects on information asymmetry (Bayar et al., 2017; Ben-Amar et al., 2019). The methodological analysis attempts to disentangle the effects of these three OFC characteristics on the information asymmetry caused by higher earnings management. The main dependent variable is a proxy of earnings management due to its relation with the information asymmetry variable. The shipping industry has a global nature, tight regulations regarding its operation, and the need for a flexible regulatory environment. In turn, shipping firms are often incorporated in countries offering the characteristics of an OFC. However, at the same time, shipping firms have high funding needs and consequently demonstrate high financial reporting quality to attract capital.[2]

[1] We specifically target firms incorporated in OFCs rather than firms with subsidiaries in such jurisdictions because the former may capitalize on the advantages of OFCs in a more direct manner (Durnev et al., 2016).

[2] Isidro and Raonic (2012) find that financial reporting quality is positively related to, among other characteristics, leverage and external financing.

The main research question of the chapter is whether maritime firms choose OFCs as a place of incorporation to take advantage of their characteristics. Moreover, the chapter extends previous research by examining if any combinations of the OFCs' characteristics have any positive rather than negative effects on information asymmetry. For example, there can be cases where the contemporaneous presence of OFCs' characteristics drives the opposite of the expected effect (i.e. lower information asymmetry; see Houqe et al., 2016). For the task in hand, we focus on shipping firms that have incentives for incorporation in OFCs. Desai et al. (2006) argue that firms that are large in size, are characterized by high growth, and have a high proportion of international activities, among other characteristics, have a higher likelihood of incorporation in tax havens. Moreover, the shipping sector is one of the biggest industries worldwide, showing high growth rates (UNCTAD, 2019). The research methodology is based on regression models with earnings management proxies as the main dependent variables and a number of independent variables acting as proxies of low tax rates, lax financial regulations and financial secrecy. Moreover, the models also include a number of control variables.

The rest of the chapter is as follows: Section 4.2 reviews the literature and develops our research hypotheses; Section 4.3 presents our empirical models; Section 4.4 presents the descriptive statistics, analyzes our empirical results and reports our robustness checks; Section 4.5 concludes the chapter.

4.2 Literature Review and Research Hypotheses Development

The effects of OFCs on financial reporting quality has been the topic of a number of studies in the literature. However, a critical point towards the examination of these effects is the type of services provided by the OFC. Despite the increased attention on OFCs, few studies have attempted to disentangle the fundamentally different operations that may apply in terms of tax avoidance, financial secrecy and lax regulations. Hence, most studies do not differentiate between the three factors, although this is of the essence in order to fully understand how incorporation in OFCs affects the level of financial reporting quality and consequently information asymmetry.

Durnev et al. (2017) present evidence of an inverse relationship between OFC ranking and financial reporting quality. They measure the latter using both accrual-based and real

operation earnings management. Each one of the three characteristics of the OFC (financial secrecy, tax avoidance and flexible regulation) were found by the authors to relate to lower earnings quality. Kim and Li (2017) also found a negative relation between accounting quality and incorporation in an OFC, showing that offshore firms are less conservative. However, a likely extension of their study would be to examine the cross-effects of the three characteristics, specifically, the different effects that these factors may have on earnings quality as they did not attempt to examine their cross-effects. Put differently, the cross-effects may have different implications than the individual effects of the three factors on financial reporting quality.

Ben-Amar et al. (2019) also support the differential effects of the three characteristics of the OFCs on financial reporting quality. The authors report the existence of fundamental differences between the three characteristics of OFCs, highlighting that the incentives for incorporation in OFCs extend far beyond tax avoidance. Thus, distinguishing between the three characteristics is crucial before any attempt to examine the information asymmetry and financial reporting quality of firms domiciled in OFCs. According to the authors, financial secrecy relates to the past efforts of firms, such as Enron, to hide poor financial performance. They also assess the effects of lax regulation on financial reporting efficiency. Their results imply that incorporation in countries with lax regulation relates to higher opacity in disclosure policies and thus lower financial reporting quality. However, they also report that in relation to the other two characteristics of OFCs, namely low tax rates and financial secrecy, lax regulation plays a less important role while alongside financial secrecy, it affects financial reporting efficiency. These results provide support to the argument that OFCs not only have tax haven characteristics but may also offer alternative characteristics that are valued by the firms. In turn, unless these are taken into consideration by the researchers, they may not reach the correct conclusions.

Chen et al. (2017) attempted to examine the effects of one of the three characteristics, namely financial secrecy, on the level of audit quality. The author assessed the effects of incorporation in a country with a high level of financial secrecy on the likelihood of auditors issuing a modified opinion. Their research target was to indirectly assess if the higher secrecy in these jurisdictions affects the audit quality. Their results show that the relation between the two variables is positive and, therefore, high financial secrecy in the country that a firm is domiciled leads to a higher likelihood of a modified audit opinion. However, their results also

show that the higher the level of quality of the country's governance and institutions, the weaker the relationship between modified audit opinions and financial secrecy.

Houqe et al. (2016) were among those assessing the relationship between financial secrecy and the accounting standards a country may implement with a particular focus on International Financial Reporting Standards (IFRS). Their research target related to the findings in previous studies, pointing towards the beneficial effects of the implementation of a set of high-quality standards. They found that the implementation of such a high-quality standard set (IFRS) leads to higher financial reporting quality. However, the authors also report evidence of an inverse relationship between financial reporting quality and a country's secrecy level, but most importantly, the contemporaneous effect of the two factors (high secrecy country level and IFRS) on financial reporting quality is positive. A likely explanation for the above is the presence of higher levels of governance in these countries following IFRS implementation, which, in turn, leads to the increase in financial reporting quality in countries with high secrecy. Schjelderup (2016) also argues for the inexistence of a global definition of an OFC. As a result, the author uses the terms tax haven and secrecy jurisdiction interchangeably. On the other hand, Schjelderup (2016) admits that there may be profound differences between jurisdictions offering tax haven or financial secrecy characteristics, which may lead to important differences between them. Therefore, low tax rates and increased secrecy may co-exist and different levels of these two characteristics may lead to different overall profiles for each jurisdiction. In turn, the combinations of the two characteristics may lead to different levels of information asymmetry. However, Schjelderup (2016), in agreement with previous authors, argues for the beneficial role of country governance quality in reducing information asymmetry and preventing the commitment of financial crimes.

One study that examines the contemporaneous presence of financial reporting opacity and incorporation in tax havens is Bayar et al. (2017). The authors found that when financial reporting opacity is coupled with incorporation in a tax haven, there may exist tax savings effects and tax-avoidance. The results of this study complement the results of other studies in the literature on the role of tax havens for accomplishing tax-avoidance strategies (e.g. Hanlon, 2005; Desai et al., 2006; Dyreng et al., 2013). Moreover, they also support the point of view that tax-avoiding corporate strategies lead to an increase in financial reporting opacity and subsequently to information asymmetry and corporate risk. However, there are studies in

the literature that argue that certain combinations of financial secrecy and high-quality country governance may have a positive rather than a negative impact.

Dharmapala and Hines (2009) support the relationship between tax-haven status and governance quality. Contrary to the popular belief at that time, they report a positive relationship between tax-haven status and various governance quality indices, including rule of law, corruption level, and government effectiveness. In turn, these results raise the possibility of a beneficial relationship between tax-haven status and high quality country governance, while contradicting the view that tax-havens are low governance-quality countries that attract firms based purely on tax avoidance incentives.

Durnev et al. (2017) provide an analytical assessment of financial reporting quality effects for firms operating in OFCs. The study attempted to make a distinction between the characteristics of an OFC: low tax rates, financial secrecy, and flexible regulation, arguing that these three characteristics can be found either independently or in combination in an OFC. Thus, the exact effects on financial reporting quality will be a function of the weight each one of the characteristics has on the overall effect. The authors also find evidence of lower financial reporting quality for firms having operations through subsidiaries or affiliates domiciled in OFCs compared to firms that do not have such operations. Dyreng et al. (2012) support this view and provide additional findings on the relationship between country governance quality and earnings management practices. They first established a relation between earnings management practices and tax haven country status. They showed that companies exhibit a higher earnings management level if they are associated with subsidiary incorporated in countries with a tax-haven status compared to firms that do not have subsidiaries in such countries.

However, a relationship between tax avoidance and high corporate risk has also been found. Kim et al. (2011) directly assessed the relationship between corporate risk and tax-avoidance. The authors used a tail-risk measure, namely stock crash risk, to examine how the engagement with tax-avoidance practices may lead to corporate risk, thereby extending previous findings on the positive relationship between stock-crash risk and tax avoidance. However, their results reveal an additional fact in relation to the positive relationship between stock crash risk and tax-avoidance. They show that managers may be able to avoid reporting bad news (bad news hoarding) using tax-avoidance, but this strategy cannot be used for an

extended period of time After a certain point, the bad news is disclosed to the market and in turn, the firm faces a stock crash.

The shipping industry may provide the ideal setting to examine the effects of the three characteristics (lax regulation, low tax rates and financial secrecy) and their combined effects on information asymmetry and financial reporting quality. First, it is a sector with high capital needs and therefore based on debt financing (Alexandridis et al., 2020). Second, most of the firms in this industry run their operations globally and in many cases are incorporated in countries offering one or all of the OFC characteristics. Moreover, some of these jurisdictions may provide additional incentives in the form of flexible regulations especially designed for the shipping industry (denoted as FOCs; Ford and Wilcox, 2019).

On the other hand, shipping firms may also satisfy their demand for high funding through capital markets. Indeed, Ahrends et al. (2018) argue that the global financial crisis of 2007-2009 led to a change in the way shipping firms fund their operations by switching from bank lending to capital markets. Andreou et al. (2014) argue that shipping firms should emphasize their high financial reporting quality in order to reduce agency conflicts and information asymmetry and thus attract investors. The authors assessed financial reporting quality through earnings management and found that shipping firms with lower earnings management may have reduced information asymmetry.

A study supporting the relationship between financial reporting quality and financial needs is Isidro and Raonic (2012), which examined a number of factors relating to financial reporting quality. They found that firms with high levels of financial reporting quality are firms that contemporaneously have ,higher financing needs. As argued above shipping firms are characterized by high funding needs due to the high investment in fixed assets, which in turn may lead to higher financial reporting quality to attract capital. However, at the same time, these firms have a higher likelihood of being incorporated in countries with tax-haven status, which have been found to relate to higher information asymmetry. As a result, it presents a natural laboratory in order to examine the effects of OFCs on financial reporting quality.

The research hypotheses of the chapter are developed following the preceding analysis. These research hypotheses pivot around the three characteristics of an OFC, namely low tax

rates, financial secrecy and lax regulation, and assert a negative effect on financial reporting quality (i.e. higher earnings opacity). These research hypotheses serve as the benchmark hypotheses regarding the individual effects of each factor on financial reporting quality. They are based on Bayar et al. (2017; see also Durnev et al., 2017) who examine the negative relation between tax avoidance incentives and financial reporting quality and the positive relation between incorporation in a country due to financial secrecy incentives and earnings management (see also Chen et al., 2017; Houqe et al., 2016) and Ben-Amar et al. (2019) who examine the positive relation between low country governance quality and low earnings quality. Thus, the first set of research hypotheses is as follows:

***H_{1A}**: Shipping firms that have their headquarters in a tax haven have lower levels of earnings quality.*

***H_{1B}**: The lower the financial secrecy score of a country, the higher the level of earnings quality.*

***H_{1C}**: The lower the ranking of a country in terms of its governance and institutional quality, the lower the level of earnings quality.*

Subsequently, we move to the next research hypothesis, which examines the cross-effects of the three factors. Our assertion is that certain combinations of the three characteristics may have different implications than other combinations for financial reporting quality. In view of the above, we draw a distinction between jurisdictions that focus on providing financial secrecy but have high-quality country governance, and jurisdictions that have pure tax haven characteristics (low tax rates and country governance quality).

One of the first studies to support this argument is Dharmapala and Hines (2009), who found a positive relationship between high country governance quality and tax-haven status. This view may seem controversial, especially in the light of studies relating tax havens with money laundering activities and tax avoidance (e.g. Picard and Pieretti, 2011), and it may have an intuitive interpretation. Countries with high governance quality may offer financial secrecy as part of their incentive strategy to attract foreign capital, and these policies help in establishing a high level of trust with those firms due to the assurance that their sensitive financial information will not be disclosed to other countries. We denote OFCs that offer these characteristics as high-quality OFCs. Firms domiciled in such jurisdictions are asserted to have a higher level of financial reporting quality, based on previous studies that show a positive

relationship between regulation and institutional quality and financial reporting quality in an international setting (Leuz et al., 2003; Boonlert-U-Thai et al., 2006; Daske et al., 2008; Houqe et al., 2012). In contrast, we denote OFCs whose main characteristics are high financial secrecy and low governance quality as low-quality OFCs (in all these cases, we use the median as the cutoff point), which likely relate to low levels of financial reporting quality based on the previous literature (e.g. Houqe et al., 2012). Thus, our second research hypothesis is as follows:

***H₂**: Low-quality OFCs have lower earnings quality; high-quality OFCs have higher earnings quality.*

4.3. The Model and Research Methodology

The research methodology followed in the chapter is based on decomposing the effects of the three factors and in turn examining their combined effects on financial reporting quality. First, the individual effects of the three factors are examined by including them along with controls in regressions that have various forms of earnings management proxies as the main dependent variables. Second, the combined effects of the factors are examined using cross-terms. To achieve this research task, two groupings are made: one for countries offering mainly low tax rate incentives, denoted as low-quality OFCs, and one for countries that have financial secrecy as the main characteristic, denoted as high-quality OFCs.

We use a number of earnings management related proxies. These variables are based on an accruals-based earnings management model that generates discretionary accruals. The variables used are discretionary residuals, estimated as the residuals of the modified Jones (1991) model, as proposed by Dechow et al. (1995; see also Jones, 1991 and Andreou et al., 2014) the positive as well as the negative discretionary accruals of the models. Moreover, we use as our main variable the earnings opacity measure of Hutton et al. (2009). The model is estimated cross-sectionally for each year and all firms as follows:

$$Accruals_i = \alpha_0 + \alpha_1 \frac{1}{TA_{i,t-1}} + \alpha_2(\Delta SALES_i - \Delta ACC\_REC_i) + \alpha_3 PPE_i + \alpha_4 OCF_i + \alpha_5 BtM_i + \upsilon_i \quad (4.1)$$

where *Accruals* is the difference between net income and operating cash flow deflated by the lag of total assets, *TA* is total assets, Δ*SALES* is the change in total revenues deflated by the lag of total assets, Δ*ACC_REC* is the change in accounts receivable deflated by the lag of total assets, *PPE* is the property plant and equipment deflated by the lag of total assets, *OCF* is the ratio of operating cash flow to the lag of total assets, and *BtM* is the book to market ratio.

We estimate earnings opacity as the three-year moving average (using two lags and the current year) of absolute residuals of eq. (4.1) and denoted as *OPACITY*. Moreover, we also use the absolute value of discretionary accruals (denoted as *Abs_DA*), estimated as the absolute value of the residuals of the model of eq. (4.1); the positive discretionary accruals (denoted as *Positive_DA*), which is a variable equal to the estimated residuals of the model of eq. (4.1) if they have a positive value, and zero otherwise; and the negative discretionary accruals (denoted as *Negative_DA*), which is a variable equal to the estimated residuals of the model of eq. 4.1 if they have a negative value, and zero otherwise. As Durnev et al. (2017) argue, positive accruals are related mainly to decreases in financial reporting quality, while negative accruals may be linked to higher earnings quality. For brevity, we use the term *EM_PROXY* in the subsequent equations (eq. (4.2) - (4.5)) to represent each one of these variables.

The main models of the research models of the chapter use the aforementioned dependent variables denoted as *EM_PROXY* (it takes the form of each one of the dependent variables described above) in a regression using a number of control variables and proxies for the three characteristics of an OFC, namely the likelihood of being a tax haven, the level of financial secrecy, and the regulatory quality index. To measure the tax-haven status, we use a dummy variable denoted as *TAX_HAVEN*, which takes a value of 1 if a firm has headquarters in a country included in the list of tax havens compiled by Col and Patel (2019). The countries of our dataset that belong to this list are indicated by 'TH' in Panel A of Table 4.1. Moreover, we use the financial secrecy score (denoted as *FS_SCORE*) of the Tax Justice Network as our proxy for financial secrecy. Lastly, to control for country differences in the level of regulatory quality, we also include a proxy for regulation quality, denoted as *GOV_INDEX*. The resulting model is as follows:

$$EM\_PROXY_{i,t} = \beta_0 + \beta_1 TAX\_HAVEN_{i,t} + \beta_2 FS\_SCORE_{i,t} + \beta_3 GOV\_INDEX_{i,t} + \beta_4 LEVERAGE_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 BIG4_{i,t} + \beta_7 UNQUALIFIED\_OP_{i,t} + \varepsilon_{i,t} \quad (4.2)$$

where *EM_PROXY* is one of the financial reporting quality proxies described above (absolute, positive or negative discretionary accruals, as defined above), *TAX_HAVEN* is a binary variable taking a value of 1 if a firm has headquarters in a country with tax-haven status, based on the list of Col and Patel (2019), and zero otherwise, *FS_SCORE* is the financial secrecy score attributed by the Tax Justice Network to the country where a firm has its headquarters, *GOV_INDEX* is the governance quality index of Dharmapala and Hines (2009), based on the measures of Kaufmann et al. (2005; see also Kaufmann et al. 2011).[3] Regarding the control variables, we include *LEVERAGE* as the leverage index estimated as the sum of short and long-term debt divided by total assets, *SIZE* as the logarithm of total assets, *BIG4*as a binary variable that takes a value of 1 if a firm is audited by a "Big 4" auditor (i.e. PWC, Deloitte, EY and KPMG),[4] and zero otherwise, and *UNQUALIFIED_OP* as a binary variable that takes a value of 1 if a firm had an unqualified audit opinion in the given year, and zero otherwise. For the estimation of the main models, we use regional fixed effects (using the World Bank's definitions) as well as robust standard errors.

The second model of this chapter aims at disentangling any combined effects of the three OFC characteristics. For the task in hand, we use the grouping described above regarding high and low-quality OFCs. To estimate a proxy of the groupings, we construct two binary variables as proxies for high financial secrecy and low regulatory enforcement. In this respect, the cross-terms of these variables with the tax haven variable will indicate jurisdictions where the effects of the one characteristic of OFCs (low tax rates) will be more profound in relation to the other two (low regulatory enforcement and financial secrecy). The model is as follows:

[3] Dharmapala and Hines (2009) estimate a Governance Index as the unweighted mean of five out of the six governance measures of Kaufmann et al. (2005): political stability, regulatory quality, rule of law, voice and accountability, and corruption control. They exclude the regulatory quality variable because some of its determinants may relate to a country's tax system. We follow a similar approach.

[4] We follow previous literature (e.g. Roosenboom et al., 2003) and include the *BIG4* dummy variable because it has been found to be associated with a limitation of earnings management due to audits of higher quality.

$$
\begin{aligned}
EM\_PROXY_{i,t} = {} & \gamma_0 + \gamma_1 TAX\_HAVEN_{i,t} + \gamma_2 HIGH\_FSS\_D_{i,t} \\
& + \gamma_3 LOW\_GOV\_INDEX\_D_{i,t} \\
& + \gamma_4 TAX\_HAVEN_{i,t} \times HIGH\_FSS\_D_{i,t} \\
& + \gamma_5 TAX\_HAVEN_{i,t} \times LOW\_GOV\_INDEX\_D_{i,t} \\
& + \gamma_6 HIGH\_FSS\_D_{i,t} \times LOW\_GOV\_INDEX\_D_{i,t} \\
& + \gamma_7 HIGH\_FSS\_D_{i,t} \times LOW\_GOV\_INDEX\_D_{i,t} \times TAX\_HAVEN_{i,t} \\
& + \gamma_8 LEVERAGE_{i,t} + \gamma_9 SIZE_{i,t} + \gamma_{10} BIG4_{i,t} + \gamma_{11} UNQUALIFIED\_OP_{i,t} + \phi_{i,t}
\end{aligned}
\tag{4.3}
$$

where *HIGH_FSS_D* is a binary variable taking a value of 1 if a firm is domiciled in a country belonging to the upper 50% of countries ranked by level of financial secrecy, and zero otherwise, *LOW_GOV_INDEX_D* is a binary variable taking a value of 1 if a firm is domiciled in a country belonging to the lower 50% of countries ranked by governance index, and zero otherwise, and all other variables are as defined above. The research specification of eq. (4.3) enables the examination of the combined effects of the three characteristics.

Moreover, we also examine a second research specification that targets the effects of high-quality OFCs on earnings quality. In this research specification, we substitute *LOW_GOV_INDEX_D* with *HIGH_GOV_INDEX_D*, which is defined as one minus *LOW_GOV_INDEX_D*.

Various models are used for the robustness checks of the chapter. First, we start with the effects of the Global Financial Crisis. As Filip and Raffournier (2014) show, the Global Financial Crisis negatively affected the earnings management level of European firms. Thus, eq. (4.3) is re-estimated using a set of intercept and slope dummies to examine the effects of the crisis, but we specifically denote the period 2008-2010 as the period of the crisis because the shipping sector was affected mainly during this period (following Ahrends et al., 2018). For the task in hand, a binary variable denoted as *CRISIS* is constructed to take a value of 1 for the years 2008-2010 and zero otherwise, and we estimate the following equation:

$$
\begin{aligned}
EM\_PROXY_{i,t} = {} & \beta_0 + \beta_1 TAX\_HAVEN_{i,t} + \beta_2 FS\_SCORE_{i,t} \\
& + \beta_3 GOV\_INDEX_{i,t} + \beta_4 CRISIS_{i,t} \\
& + \beta_5 CRISIS_{i,t} \times TAX\_HAVEN_{i,t} + \beta_6 CRISIS_{i,t} \times FS\_SCORE_{i,t} \\
& + \beta_7 LEVERAGE_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 BIG4_{i,t} \\
& + \beta_{10} UNQUALIFIEDOP_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{4.4}
$$

Second, following the OECD's announcement in 2002 (April 2002), we use the list of non-cooperative countries regarding the information on tax havens and create a binary variable, denoted as *OECD_2003,* which takes the value of one for the year 2003 and zero otherwise. The rationale of the announcement was to enforce the countries on the list to cooperate and increase supervision (Durnev et al., 2016b). Since the OECD announcement took place during 2002, we expect to see the results, if any, in year 2003. The model we estimate is as follows:

$$\begin{aligned} EM\_PROXY_{i,t} = {} & \beta_0 + \beta_1 TAX\_HAVEN_{i,t} + \beta_2 FS\_SCORE_{i,t} \\ & + \beta_3 GOV\_INDEX_{i,t} + \beta_4 OECD\_2003_{i,t} \\ & + \beta_5 OECD\_2003_{i,t} \times TAX\_HAVEN_{i,t} \\ & + \beta_6 OECD\_2003_{i,t} \times FS\_SCORE_{i,t} \\ & + \beta_7 LEVERAGE_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 BIG4_{i,t} \\ & + \beta_{10} UNQUALIFIEDOP_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{4.5}$$

4.4 The Data

The sample for this chapter is drawn from Compustat Global for the period 1996-2018. The initial sample includes firms that have Standard Industrial Classification (SIC) codes of 4400 and 4412. These codes relate to the maritime sector. Moreover, we draw data on tax-haven status from Col and Patel (2019) and for financial secrecy scores from the Tax Justice Network.[5] Lastly, data on governance indicators as well as data to estimate regional effects are drawn from the World Bank. The data on regulatory enforcement and other country governance indicators are based on the study of Kaufmann et al. (2010).

To categorize firms into countries, we use the country where they have their headquarters following the previous literature (i.e. Durnev et al., 2017) in that the categorization of a firm's headquarters location is related to the level of information asymmetry between shareholders and management. A number of filters are applied to the primary sample: First, following Drobetz et al. (2013), we only retain in the sample those maritime firms associated with owning and/or operating ships. Second, we exclude firms with

[5] The Tax Justice Network uses 20 different indicators to compile its financial secrecy index and rank jurisdictions according to their financial secrecy levels (https://www.financialsecrecyindex.com/).

poor financial performance (firms with negative book values of equity). Third, to avoid the influence of extreme observations, we discount those observations falling in the upper or lower 1% of the distribution of each continuous variable. For the models in which opacity is used as the dependent variable, the number of firms is 228, with 1,780 observations, and for the models using discretionary accruals (in absolute, only positive and only negative forms) as the dependent variable, there are 262 firms and 2,323 observations. The number of firms and observations are reported in each of the tables showing the estimation results of Equations 2 and 3, while the variable definitions are documented in Appendix B.

Table 4.1: Number of Firms by Country and Tax-Haven Status

Country	ISO Country Code	Observations	Firms	Tax-Haven Status
Australia	AUS	6	2	
Bangladesh	BGD	5	1	
Belgium	BEL	41	3	
Bermuda	BMU	34	5	TH
Brazil	BRA	23	3	
Chile	CHL	39	7	
China	CHN	78	9	
Croatia	HRV	40	6	
Cyprus	CYP	11	2	TH
Denmark	DNK	49	5	
Egypt	EGY	9	1	
Estonia	EST	5	1	
Finland	FIN	29	4	
France	FRA	19	3	
Germany	DEU	20	2	
Greece	GRC	46	5	
Hong Kong	HKG	119	10	TH
Indonesia	IDN	86	14	
Ireland	IRL	12	1	TH
Italy	ITA	13	3	
Japan	JPN	39	4	
Jordan	JOR	16	2	TH
Korea	KOR	82	10	

Latvia	LVA	13	1	
Lithuania	LTU	7	1	
Luxembourg	LUX	10	1	TH
Malaysia	MYS	42	7	
Mexico	MEX	11	1	
Netherlands	NLD	18	3	
Norway	NOR	283	37	
Philippines	PHL	24	2	
Portugal	PRT	10	1	
Qatar	QAT	25	3	
Russia	RUS	12	3	
Saudi Arabia	SAU	16	1	
Singapore	SGP	83	11	TH
Sweden	SWE	49	8	
Taiwan	TWN	167	14	
Thailand	THA	64	8	
UK	GBR	50	7	
United Arab Emirates	ARE	9	2	
USA	USA	8	1	
Vietnam	VNM	58	13	
All		1780	228	

Notes: The tax-haven status is based on the study of Col and Patel (2019).

Panel A of Table 4.1 presents several statistics on the sample. Specifically, it includes the numbers of firms and observations as well as the presence of tax-haven status (denoted as TH) by country.

Table 4.2: Descriptive Statistics

Panel A: All Firms					
	Mean	Median	Maximum	Minimum	Std. Dev.
OPACITY	0.123	0.100	0.609	0.005	0.090
Abs_DA	0.040	0.028	0.215	0.000	0.038
Positive_DA	0.020	0.001	0.189	0.000	0.032
Negative_DA	-0.020	0.000	0.000	-0.215	0.035
FS_SCORE	0.569	0.593	0.839	0.000	0.179
GOVERNANCE_INDEX	0.870	1.067	1.994	-1.064	0.823
LEVERAGE	0.392	0.403	0.914	0.000	0.203
SIZE	5.899	5.972	9.510	0.630	1.485
BIG4	0.642	1.000	1.000	0.000	0.479
UNQUALIFIED_OP	0.759	1.000	1.000	0.000	0.428
TAX_HAVEN	0.160	0.000	1.000	0.000	0.367
Panel B: Tax Havens					
	Mean	Median	Maximum	Minimum	Std. dev.
OPACITY	0.142	0.124	0.579	0.009	0.100
Abs_DA	0.046	0.034	0.209	0.000	0.042
Positive_DA	0.028	0.012	0.189	0.000	0.037
Negative_DA	-0.018	0.000	0.000	-0.209	0.037
FS_SCORE	0.644	0.711	0.731	0.000	0.166
GOVERNANCE_INDEX	1.253	1.360	1.736	-0.118	0.369
LEVERAGE	0.305	0.329	0.850	0.000	0.212
SIZE	6.035	5.991	8.987	1.572	1.538
BIG4	0.750	1.000	1.000	0.000	0.434
UNQUALIFIED_OP	0.889	1.000	1.000	0.000	0.314

Notes: The sample concerns the period 1996-2018 and includes firms with SIC 4400 or 4412 that own and/or operate commercial ships. Definitions of the variables are provided in Appendix B. The number of firms and observations are reported in Tables 4.4 to 4.7.

Table 4.3: Correlation Matrix

	OPACITY	Abs_DA	Positive_DA	Negative_DA	FS_SCORE	GOV_INDEX	LEVERAGE	SIZE
OPACITY	1.000							
Abs_DA	0.663***	1.000						
Positive_DA	0.391***	0.498***	1.000					
Negative_DA	-0.362***	-0.629***	0.362***	1.000				
FS_SCORE	-0.127***	-0.076***	-0.091***	0.001	1.000			
GOV_INDEX	0.013	0.009	0.027	0.014	0.094***	1.000		
LEVERAGE	-0.158***	-0.109***	-0.338****	-0.186***	0.027	0.088***	1.000	
SIZE	-0.294***	-0.218***	-0.072***	0.170***	0.240***	0.172***	0.239***	1.000

Notes: The sample concerns the period 1996–2018 and includes firms with SIC 4400 or 4412 that own and/or operate commercial ships. Definitions of the variables are provided in Appendix B. The number of firms and observations are reported in Tables 4.4 to 4.7. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels, respectively.

Table 4.4: Financial Reporting Quality and the Three OFC Dimensions

	Panel A: OPACITY		***Panel B: Abs_DA***		***Panel C: Positive_DA***		***Panel D: Negative_DA***	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
INTERCEPT	0.261***	13.387	0.081***	15.928	0.042***	7.932	-0.039***	-8.478
TAX_HAVEN	0.024*	1.849	0.010***	2.657	0.004	1.109	-0.006**	-2.198
FS_SCORE	-0.012	-0.510	-0.006	-0.972	-0.012*	-1.839	-0.006	-0.982
GOVERNANCE_INDEX	0.008	1.215	0.000	0.078	0.001	0.424	0.001	0.360
LEVERAGE	-0.047*	-1.777	-0.012**	-1.976	-0.045***	-7.820	-0.033***	-6.736
SIZE	-0.019***	-6.534	-0.005***	-6.938	0.000	-0.705	0.005***	5.985
BIG4	0.004	0.457	0.001	0.448	0.004**	1.998	0.003	1.357
UNQUALIFIED_OP	-0.028***	-4.079	-0.011***	-4.326	0.000	0.251	0.011***	4.565
Period effects	Included		Included		Included		Included	
Regional effects	Included		Included		Included		Included	
Observations	1780		2321		2321		2321	
Firms	228		262		262		262	
Adj. R^2	0.160		0.083		0.106		0.093	

Notes: The sample concerns the period 1996–2018 and includes firms with SIC 4400 or 4412 that own and/or operate commercial ships. Definitions of the variables are provided in Appendix B. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels, respectively.

Table 4.2 presents the descriptive statistics categorized into two Panels: Panel A, which presents the statistics of the whole sample, and Panel B, which presents the statistics for the tax haven countries. As can be seen in those panels of Table 4.2, there is no evidence of extreme observations. Moreover, the firms of countries with tax-haven status have higher levels of opacity, as indicated by the means of the relevant variable in Panels B and C.

Table 4.3 presents the correlation matrix. Multicollinearity does not seem to be present. Moreover, the correlation coefficients of financial secrecy in relation to opacity, absolute discretionary accruals, and positive discretionary accruals are all negative and significant. On the other hand, governance quality (*GOV_INDEX*) has insignificant correlation coefficients in relation to all discretionary accrual's variables, but it has a positive and significant coefficient in relation to financial secrecy. These results imply that the financial secrecy level of a country may confer different information content on tax-haven status and be associated with higher governance quality. This offers support to our low and high-quality OFCs hypothesis (H_2).

4.5. Empirical Results

4.5.1 Main Results

The main empirical results start with the results of the estimation of eq. (4.2), which are presented in Table 4.4. Panel A considers the equation using the opacity variable as the dependent variable, and Panels B-D the other three discretionary accruals variables. As regards the control variables, three of them have a negative and significant coefficient (size, leverage and unqualified audit opinion), while the other one (Big 4 auditor) has an insignificant coefficient. Regarding the sign of the relation between size and opacity, the results are in agreement with previous literature (e.g. Hutton et al., 2009). Moreover, the negative relationship between *UNQUALIFIED_OP* and *OPACITY* shows that auditing characteristics may also represent information content for proxies of earnings management. Moreover, *LEVERAGE* is negatively related to both positive and negative accruals (Panels C and D, respectively). This result is likely related to Isidro and Raonic (2012), who show that firms with higher financing needs attempt to increase financial reporting quality in order to attract greater funding.

On the other hand, of the three variables of interest, only *TAX_HAVEN* is significant. This result supports research hypothesis H_{1A} and implies that the earnings opacity of shipping firms with headquarters in tax havens is higher compared to other firms. Moreover, it also implies that the two other variables may not produce incremental information content for earnings opacity in comparison to tax-haven status.

Panels B to D report the rest of the results of estimating eq. (4.3) with the alternative dependent variables. The results show that the positive relationship between earnings quality and tax havens is robust (the coefficient of *TAX_HAVEN* in Panel B is also positive and significant). However, the results concerning either positive (in Panel C) or negative accruals (in Panel D) reveal that tax-haven status is mainly associated with lower negative accruals. This result probably implies that firms in such countries do not attempt to manage their earnings downward. On the contrary, firms with headquarters in countries with high financial secrecy scores have lower positive accruals (Panel C). Since positive accruals have been associated with lower earnings quality (Durnev et al., 2017), this result suggests a positive role for financial secrecy in relation to earnings quality.

In sum, these results reveal a pattern relating the effects of financial secrecy and tax-haven status to earnings quality. Given the positive role of negative accruals for earnings quality (and the negative role of positive accruals) emphasized by Durnev et al. (2017), it seems that financial secrecy increases rather than decreases earnings quality, while tax-haven status decreases earnings quality. On the other hand, the level of governance quality does not seem to directly affect earnings quality, in incremental terms relative to the other variables. Thus, we do not have significant evidence in favor of research hypotheses H_{1B} and H_{1C}, but we find evidence to support research hypothesis H_{1A}.

These results are not in agreement with the previous literature, which shows that all three of these OFC characteristics are related negatively to the level of financial reporting quality (i.e. Durnev et al., 2017). However, a critical difference between the methodological framework of our study and that of Durnev et al. (2017) is that the latter mainly involved firms operating in OFCs through subsidiaries or affiliates, whereas our study relates to firms with headquarters in OFCs. This critical difference may explain the results, in that firms with headquarters in an OFC, as for the shipping firms in our sample, may have different incentives in comparison to firms operating in an OFC through subsidiaries or affiliates.

Table 4.5: Financial Reporting Quality and the Three OFC Dimensions – Low-quality OFCs

	Panel A: OPACITY		***Panel B: Abs_DA***		***Panel C: Positive_DA***		***Panel D: Negative_DA***	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
INTERCEPT	0.287***	12.071	0.086***	14.339	0.042***	7.276	-0.044***	-6.964
TAX_HAVEN	-0.018	-1.506	0.001	0.142	0.003	1.127	0.002	0.531
HIGH_FSS_D	-0.046***	-3.144	-0.011**	-2.405	-0.007*	-1.674	0.004	0.959
LOW_GOV_INDEX_D	-0.036**	-2.430	-0.005	-1.189	-0.003	-0.878	0.002	0.423
HIGH_FSS_D×LOW_GOV_INDEX_D	0.060***	3.357	0.010*	1.887	0.005	1.241	-0.004	-0.864
HIGH_FSS_D×TAX_HAVEN	0.073***	3.838	0.015**	2.297	0.002	0.546	-0.012**	-2.180
LOW_GOV_INDEX_D×TAX_HAVEN	0.018	0.417	-0.001	-0.148	0.003	0.324	0.005	0.822
HIGH_FSS_D×LOW_GOV_INDEX_D×TAX_HAVEN	0.004	0.070	0.006	0.332	-0.003	-0.244	-0.009	-0.650
LEVERAGE	-0.045*	-1.754	-0.012*	-1.992	-0.045***	-7.911	-0.033***	-6.618
SIZE	-0.020***	-6.753	-0.005***	-7.002	-0.001	-1.004	0.005***	6.031
BIG4	0.004	0.529	0.000	0.070	0.003*	1.715	0.003	1.608
UNQUALIFIED_OP	-0.029***	-4.098	-0.011***	-4.433	0.000	0.155	0.011***	4.611
Period effects	Included		Included		Included		Included	
Regional effects	Included		Included		Included		Included	
Observations	1,780		2,321		2,321		2,321	
Firms	228		262		262		262	
Adj. R^2	0.175		0.086		0.104		0.093	

Notes: The sample concerns the period 1996–2018 and includes firms with SIC 4400 or 4412 that own and/or operate commercial ships. Definitions of the variables are provided in Appendix B. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels, respectively.

Based on our results, there is a pattern emerging in terms of the effects of the three characteristics of an OFC on earnings quality. Specifically, OFCs with high-quality governance and high financial secrecy are likely to be "high-quality" OFCs, where firms are incorporated because of their need for high-quality services. On the other side, we see "low-quality" OFCs, where shipping firms may be incorporated because of tax avoidance incentives.

The next set of results regards the high and low-quality OFCs. The two versions of eq. (4.3) are estimated and the results are reported in Tables 4.5 and 4.6. Table 4.5 shows that the positive relationship between tax-haven status and earnings opacity is driven mainly by countries with high financial secrecy. To be specific, the presence of either high financial secrecy and tax-haven status (*HIGH_FSS_D×TAX_HAVEN*) or high financial secrecy and low governance quality (*HIGH_FSS_D×LOW_GOV_INDEX_D*) leads to lower earnings quality. This result offers support to research hypothesis H_2 and implies that firms in countries with those combined characteristics have lower earnings quality.

Moreover, the persistence of the coefficient of the *HIGH_FSS_D×TAX_HAVEN* cross-term in all panels, apart from Panel C, shows that the positive effects of tax havens previously reported for earnings opacity in Table 4.4 are reinforced for countries with high financial secrecy. Furthermore, the coefficient for a high financial secrecy score (*HIGH_FSS_D*) is now negative and highly significant for both opacity (Panel A) and absolute discretionary accruals (Panel B). These results are in agreement with our assertion that tax-haven status can have different effects on earnings management and the conditioning variable is financial secrecy. Thus, simply assessing the effects of tax havens and/or financial secrecy without also controlling for their cross-effects may lead to erroneous conclusions.

Next, we estimate eq. (4.3), but we substitute *LOW_GOV_INDEX_D* with *HIGH_GOV_INDEX_D* and present the results, which support the previous findings, in Table 4.6. As can be seen, shipping firms in countries with high governance index and high secrecy have higher earnings quality, as shown by the coefficient for *HIGH_FSS_D×HIGH_GOV_INDEX_D*, which is negative and significant for both Panels A and B (opacity and absolute discretionary accruals regressions).

Table 4.6: Financial Reporting Quality and the Three OFC Dimensions – High-quality OFCs

	Panel A: OPACITY		***Panel B: Abs_DA***		***Panel C: Positive_DA***		***Panel D: Negative_DA***	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
INTERCEPT	0.251***	13.132	0.081***	16.094	0.038***	7.518	-0.042***	-8.249
TAX_HAVEN	0.000	0.001	-0.001	-0.090	0.006	0.629	0.007*	1.714
HIGH_FSS_D	0.014	0.968	-0.001	-0.245	-0.002	-0.482	-0.001	-0.245
HIGH_GOV_INDEX_D	0.036**	2.430	0.005	1.189	0.003	0.878	-0.002	-0.423
HIGH_FSS_D×HIGH_GOV_INDEX_D	-0.060***	-3.357	-0.010*	-1.887	-0.005	-1.241	0.004	0.864
HIGH_FSS_D×TAX_HAVEN	0.077	1.346	0.020	1.294	-0.001	-0.052	-0.021*	-1.718
HIGH_GOV_INDEX_D×TAX_HAVEN	-0.018	-0.417	0.001	0.148	-0.003	-0.324	-0.005	-0.822
HIGH_FSS_D×HIGH_GOV_INDEX_D×TAX_HAVEN	-0.004	-0.070	-0.006	-0.332	0.003	0.244	0.009	0.650
LEVERAGE	-0.045*	-1.754	-0.012*	-1.992	-0.045***	-7.911	-0.033***	-6.618
SIZE	-0.020***	-6.753	-0.005***	-7.002	-0.001	-1.004	0.005***	6.031
BIG4	0.004	0.529	0.000	0.070	0.003*	1.715	0.003	1.608
UNQUALIFIED_OP	-0.029***	-4.098	-0.011***	-4.433	0.000	0.155	0.011***	4.611
Period effects	Included		Included		Included		Included	
Regional effects	Included		Included		Included		Included	
Observations	1,780		2,321		2,321		2,321	
Firms	228		262		262		262	
Adj. R^2	0.175		0.086		0.104		0.093	

Notes: The sample concerns the period 1996–2018 and includes firms with SIC 4400 or 4412 that own and/or operate commercial ships. Definitions of the variables are provided in Appendix B. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels, respectively.

In contrast, the cross-term between high financial secrecy and tax-haven status (*HIGH_FSS_D×TAX_HAVEN*) is insignificant. These results offer support to our research hypothesis H_2 and imply that the contemporaneous presence of high-quality country governance and financial secrecy leads to higher rather than lower earnings quality.

On the contrary, according to the results of Table 4.6, a critical condition for the existence of lower earnings quality for firms domiciled in tax havens is a high level of financial secrecy in such countries. This is a likely indication that firms with high-quality financial reporting may choose to base their headquarters in countries with the above characteristics due to an appealing institutional framework that is friendly to foreign investments.

Thus, our results show that it is the low vs high-quality OFC effects rather than the tax-haven and no-tax-haven status that have the main impact on earnings quality. In this respect, the critical difference lies in the contemporaneous effects on the earnings quality of tax-haven status and high governance quality when combined with financial secrecy.

4.5.2 Robustness Checks

The results of the methodological analysis of this chapter reveal that the type of OFC (i.e. high vs low quality) plays a role in the determination of the level of financial reporting quality of a shipping firm. To examine the robustness of these results, we perform a number of sensitivity checks. The robustness checks examine the effects of the 2008-2010 shipping crisis, the OECD announcement about the list of uncooperative countries, and the effects of high-quality accounting standards (IFRS) that have been found in previous studies to impact accounting quality.

4.5.2.1 The 2008-2010 Shipping Crisis

The Global Financial Crisis of 2007-2009 also took a toll on the shipping industry. However, the negative outcome of the crisis took a little longer to flow through the shipping

sector and the crisis for this industry concerned the period 2008-2010 (see Grammenos and Papapostolou, 2012; Ahrends et al., 2018).

Table 4.7: Robustness Checks for Earnings Opacity

Panel A: IFRS Effects			***Panel B: Crisis Effects***			***Panel C: 2002 OECD Announcement Effects***		
	Coefficient	t-Statistic		Coefficient	t-Statistic		Coefficient	t-Statistic
INTERCEPT	0.247***	13.967	INTERCEPT	0.254***	12.443	INTERCEPT	0.263***	13.309
TAX_HAVEN	0.044**	2.544	TAX_HAVEN	0.028**	2.119	TAX_HAVEN	0.026**	2.081
FS_SCORE	0.014	0.600	FS_SCORE	-0.010	-0.429	FS_SCORE	-0.011	-0.481
GOVERNANCE_INDEX	0.003	0.544	GOVERNANCE_INDEX	0.006	1.058	GOVERNANCE_INDEX	0.006	0.928
IFRS	0.095***	4.032	CRISIS	0.052**	2.343	OECD_2003	-0.094**	-2.568
IFRS×TAX_HAVEN	-0.038**	-2.233	CRISIS×TAX_HAVEN	-0.014	-0.553	OECD_2003×TAX_HAVEN	0.024	1.059
IFRS×FS_SCORE	-0.100***	-2.773	CRISIS×FS_SCORE	-0.024	-0.731	OECD_2003×FS_SCORE	0.096	1.641
LEVERAGE	-0.050*	-1.902	LEVERAGE	-0.048*	-1.833	LEVERAGE	-0.051*	-1.927
SIZE	-0.020***	-6.884	SIZE	-0.018***	-6.559	SIZE	-0.018***	-6.386
BIG4	0.004	0.473	BIG4	0.003	0.335	BIG4	0.002	0.278
UNQUALIFIED_OP	-0.028***	-4.253	UNQUALIFIED_OP	-0.030***	-4.355	UNQUALIFIED_OP	-0.033***	-4.602
Period effects	Included		Period effects	Not Included		Period effects	Not Included	
Regional effects	Included		Regional effects	Included		Regional effects	Included	
Observations	1,780		Observations	1780		Observations	1780	
Firms	228		Firms	228		Firms	228	
Adj. R^2	0.182		Adj. R^2	0.150		Adj. R^2	0.134	

Notes: The sample concerns the period 1996–2018 and includes firms with SIC 4400 or 4412 that own and/or operate commercial ships. Definitions of the variables are provided in Appendix B. *, ** and *** refer to statistical significance at the 10%, 5% and 1% levels, respectively.

One of the main reasons was the high amount of funds required to finance the building of new ships and the decrease of available funding sources as a result of the crisis. The results of the estimation of eq. (4.4) are presented in Panel B of Table 4.7, and they show that our main finding regarding the positive relationship between tax-haven status and earnings opacity is unchanged.

4.5.2.2 The OECD 2002 Tax Haven List Announcement

The next sensitivity check regards the OECD announcement and is seen as an exogenous shock (the results are presented in Panel C of Table 4.7 and regard the estimation of eq. (4.5)). As is shown, the intercept dummy (*OECD_2003*) has a negative and significant coefficient, which, however, does not seem to affect the rest of the relations in the model.

4.5.2.3 The Effects of IFRS

A number of studies have reported that earnings quality is affected by the implementation of high-quality accounting standards. Chen et al. (2014) show that the relationship between foreign direct investment (FDI) and the adoption of IFRS is positive. Moreover, they also show that the degree of convergence to IFRS plays a role in FDI growth. Because OFCs are countries that have as their main target the attraction of foreign investment, we assert that these countries may also attempt to converge their accounting standards to IFRS.

At an international level, there are similar findings. Marra et al. (2011) found that the adoption of IFRS leads to decreases in earnings management, and Houqe et al. (2016) argue that IFRS adoption may, under specific conditions, decrease the level of corruption in a country. By contrast, Krishnan and Zhang (2019) find that adoption of IFRS in a country (Canada) that previously implemented domestic accounting standards convergent with the US's Generally Accepted Accounting Principles (GAAP) may not lead to increased earnings quality. Daske et al. (2008) argue that convergence to a single set of accounting standards all over the world may increase

comparability and, in turn, an investor's ability to identify firms attempting to manage their earnings.

Therefore, the main determinant of accounting discretion and the likely use of earnings management are the reporting incentives of a firm. Daske et al. (2008) argue that among the factors affecting reporting incentives are the legal institutions of the countries in which the firm is incorporated. The results are reported in Panel A of Table 6 and show that our existing results are not sensitive to this specification. Moreover, the cross-terms of *IFRS* with tax-haven status and financial secrecy are negative and significant, implying that the implementation of accounting standards convergent with IFRS may increase financial reporting quality even in jurisdictions where firms have incentives to manage their earnings.

4.5.2.4 Additional Analysis

We performed a number of other sensitivity tests in order to examine the robustness of our results. First, the governance index variable was substituted with a regulatory quality variable. Given the significant role of governance quality in the level of financial reporting quality (e.g. Boonlert-U-Thai et al., 2006; Houqe et al., 2012), we examine whether our results are sensitive to the choice of regulatory quality, based on the total of six governance quality determinants that Kaufmann et al. (2010) identify, as the main determinant of earnings quality. In this respect, we substitute *GOV_INDEX* with *REGULATORY_QUALITY*.

In particular, this latter variable measures the strength of regulatory quality. The results (not reported here but available on request) show that our main conclusions remain unchanged. Second, we also examine whether our main results are altered when we base the grouping of the sample firms on their country of incorporation rather than that in which they have their headquarters. Once again, the results (not reported here but available on request) do not alter our existing conclusions.

4.6 Conclusions

The aim of Chapter 4 was to examine the effects of low tax rates, financial secrecy and lax regulation on the financial reporting quality of shipping firms. The methodological framework of the chapter was based on a number of models attempting to disentangle the effects on information asymmetry of the three characteristics of an OFC, along with the use of a number of earnings management proxies (opacity and absolute, positive, and negative discretionary accruals) as measures of information asymmetry.

The main conclusion of the chapter is that the three OFC characteristics may lead to lower earnings quality in certain cases, but more importantly, certain combinations of them have also incremental information over the control variables. Specifically, we find that OFCs can be divided primarily into two categories: "high-quality" and "low-quality" OFCs. The first have high regulatory enforcement and high financial secrecy, in which earnings quality increases; the latter relate to tax incentives together with high financial secrecy and/or low governance quality, and whereby earnings quality is lower. Several robustness checks involving exogenous shocks (the maritime sector crisis of 2008-2010 and the 2002 OECD declaration of uncooperative tax havens), as well as the implementation of accounting standards convergent with IFRS, do not alter the main conclusions.

The implications of this chapter relate to the global nature of the shipping industry as well as the choice of the country of incorporation and should, therefore, be of importance to regulators, practitioners, and academics. We show that simply fixating on tax-haven or non-tax-haven status may not help in uncovering the full information set of OFCs in relation to earnings management and information asymmetry. On the other hand, certain combinations of the three OFC characteristics are deemed important determinants of financial reporting quality.

Appendix B: Variable Definitions

Variable	Definition
	Variables to Estimate the Discretionary Accruals Model
Accruals	The difference between net income and operating cash flows deflated by opening total assets
$\Delta SALES$	The change in total revenues deflated by the lag of total assets
ΔACC_REC	The change in accounts receivable deflated by the lag of total assets
PPE	The property plant and equipment deflated by the lag of total assets
OCF	The ratio of operating cash flows to the lag of total assets
BtM	The book to market ratio
	Variables to Estimate the Main Models
OPACITY	The three-year moving sum of absolute discretionary accruals estimated as the value of the residuals of the model of eq. (4.1)
Abs_DA	The absolute discretionary accruals estimated as the value of the residuals of the model of eq. (4.1)
Positive_DA	The positive discretionary accruals, which is a variable equal to the estimated residuals of the model of eq. (4.1) if they have a positive value, and zero otherwise
Negative_DA	The negative discretionary accruals, which is a variable equal to the estimated residuals of the model of eq. (4.1) if they have a negative value, and zero otherwise
IFRS	A binary variable taking a value of 1 if the firm has its headquarters in a country implementing domestic standards in accordance with IFRS
TAX_HAVEN	A binary variable taking a value of 1 if the firm has its headquarters in a country with tax-haven status, based on the list of Col and Patel (2019), and zero otherwise
FSS_SCORE	The financial secrecy score attributed by the Tax Justice Network to the country where a firm has its headquarters
GOV_INDEX	The governance quality index of Dharmapala and Hines (2009), using the measures of Kaufmann et al. (2005; see also Kaufmann et al., 2011)
LEVERAGE	The leverage index estimated as the sum of short- and long-term debt divided by total assets

SIZE	The logarithm of total assets
BIG4	A binary variable that takes a value of 1 is the firm is audited by a 'Big 4' auditing firm (PWC, Deloitte, EY and KPMG), and zero otherwise
UNQUALIFIED_OP	A binary variable that takes a value of 1 if the firm had an unqualified audit opinion in a year, and zero otherwise
LOW_FSS_D	A binary variable taking a value of 1 if a firm has its headquarters in a country belonging to the lower 50% of countries ranked by their level of financial secrecy, and zero otherwise; we also estimate *HIGH_FSS_D* as 1 minus *LOW_FSS_D*
LOW_GOV_INDEX_D	A binary variable taking a value of 1 if a firm has its headquarters in a country belonging to the lower 50% of countries ranked by the level of regulatory quality, and zero otherwise; we also estimate *HIGH_GOV_INDEX_D* as 1 minus *LOW_GOV_INDEX_D*
	Variables used in the Robustness Checks
CRISIS	A binary variable, which takes a value of 1 for the years 2008–2010, signifying the shipping crisis (following Ahrends et al., 2018), and zero otherwise.
OECD_2003	A binary variable, which takes a value of 1 for the year 2003, and zero otherwise.
REGULATORY_QUALITY	A variable measuring the strength of regulatory quality as compiled by Kaufman et al. (2005; see also Kaufmann et al., 2011)

CHAPTER 5

Conclusions and Implications for Future Research

5.1 Conclusions

The present thesis examined the accounting and auditing aspects of shipping firms, thereby contributing to the literature in several aspects. First, in the second chapter, it developed a number of cases relating to the accounting treatment of special items, like leases, that constitute a large part of the everyday accounting procedures of a shipping firm. Moreover, the chapter assessed the adoption of new technologies in the shipping industry. The main findings of this chapter underline the diversity of the shipping sector relating to the accounting and auditing procedures compared to other sectors. Moreover, the study shows that the adoption of cryptocurrencies as a means of payment has a number of merits, including low or zero transaction fees and almost real-time transfer of funds. However, the adoption of cryptocurrencies is conditional on the alleviation of a number of problems relating to these. These problems are very important and mainly relate to the high volatility in relation to other assets, the absence of a central governing institution that will prevent any fraud attempts, and the possibility that they will be used for illegal purposes.

The second chapter relates to the effects of accounting standards on the financial statements of shipping firms. Given the special characteristics of the firms in this industry (high tangibility, high leverage and high funding needs), we use the research methodology to uncover the firm characteristics that relate to firm performance, the effects of leases, and any effects of impairment losses. We also take special care of the presence of earnings management as well as the use of impairments for earnings management purposes. The main findings of the chapter indicate that several firm characteristics affect earnings quality through discretionary accruals. Specifically, size and ROE are negatively related to discretionary accruals with the latter result (regarding firm performance) being conditional on the convergence of the accounting standards of the country the firm is domiciled to the IFRS. On the

contrary, the higher the fraction of the tangible assets of a shipping firm, the lower the positive or negative discretionary accruals. Regarding impairments, we find a positive relationship between firm size and the likelihood of recording an impairment, which also indicates that these firms (larger shipping firms) are likely more visible to the investors. However, we also find a positive relationship between the recognition of impairments and negative discretionary accruals, which may be related to the high tangibility ratios of these firms. The results on the last special item we examine, namely leases, show that a proxy of capitalized leases is positively related to firm performance, and this effect is even more pronounced during the shipping crisis of 2008-2010.

The last chapter examines the effects of country of incorporation on financial reporting quality. The results of the chapter show that the three characteristics relating to an Offshore Financial Centre (OFC), namely low tax rates, flexible regulations and financial secrecy, may under specific conditions affect financial reporting quality. More importantly, certain combinations of these characteristics may have incremental information content, based on a grouping into "Low-Quality" and "High-Quality" OFCs, relating respectively to countries that have low tax rates as the main characteristic and countries offering financial secrecy incentives. The results show that shipping firms domiciled in the former may have higher rather than lower financial reporting quality in some of the cases examined. On the contrary, low-quality tax havens are mainly related to lower financial reporting quality.

5.2 Limitations and Future Research

The limitations of the present study leave space for future research. First, the present thesis does not empirically assess the effects of the new financial technologies on the shipping firms due to data unavailability. Nevertheless, we believe that the fintech sector will significantly affect the shipping industry and will profoundly change the way of storing and assessing information in the shipping firms as well as the way the shipping firms are funded. For this reason, we deem it important to examine the effects of the transition to blockchain-based storing of accounting and business information as well as the use of big data analytics for shipping firms in

future research. We also all think that more research on the development of a digital currency is needed in order to help transactions for shipping firms and to alleviate the problems of the current system relating to foreign exchange risk and high transaction costs. Moreover, Decentralized Finance (DeFi) crypto-currencies may help shipping firms to gain access to cheap funding and reduce both time and cost of seeking funding sources. Since shipping firms base a large part of their operations on their borrowing function, the use of DeFi products may help in securing cheap funding fast and without the interaction with an intermediary.

Second, the present thesis does not incorporate an empirical analysis on International Financial Reporting Standard 16 Leases and its effects on financial statements due to data unavailability. IFRS 16 was implemented from 1/1/2019 and thus more years of data will be needed in order to have an adequate sample to examine the related effects. Given the important role of leases, it should be important to examine the effects of IFRS 16 on the financial statements of shipping firms that operate in countries that implement IFRS. Moreover, the analysis in the third chapter could be also enhanced by controlling for the fleet's average age per firm as well as the type of firm. These last variables would require a unique database hand-picked from the annual reports of the shipping firms. Lastly, future research on the subject could also benefit from field research through interviews with higher management executives. This research agenda will provide an alternative view of the drivers of the decisions taken in a shipping firm and will enable the examination of their effects on the value of the firm.

Third, another topic that should be granted further research is the positive effects of high-quality OFCs on financial reporting quality. This result is contrary to the traditional view that all OFCs help firms to avoid taxation and conceal various activities. However, it opens up a new perspective in our understanding of the motivations of a firm to be incorporated in an OFC. Therefore, further research and cross-examination with other sectors will provide additional results on the subject as well as the use of a classification shifting methodology to estimate the proxy for earnings management.

Fourth, the present thesis does not elaborate on the risk-management activities that a shipping firm must use through its internal control department. Given the

current adverse circumstances due to the pandemic, or other risks faced such as terrorism, it would be useful to examine how the accounting practice in these firms could help to reduce such risks and impound them in the financial statements through the use of provisions. In turn, future research could explore the effects of such provisions on the value of the shipping firms.

5.3 Implications for Practitioners Regulators and Academics

As regards the implications of the study for practitioners, regulators and academics and its contribution to the literature, the following points should be underlined. First, the results of the thesis imply that shipping firms may present a number of challenges in the accounting and auditing operations due to a number of reasons underlined in the previous chapters, such as the high costs of processing information. In this respect, investing in new technologies may help to alleviate some of these problems and reduce costs.

Second, certain accounts of the shipping firms like impairments and leases may need additional deliberation. The results of the thesis show that under specific conditions, the way a shipping firm recognizes impairments or leases may impact on firm performance and information asymmetry. Specifically, the results of the thesis imply that the use of leases may have positive effects on shipping firms' performance. On the contrary, the results on impairments show that in some of the examined cases these are related to discretionary accruals and thus lower accounting quality.

Third, the high frequency of the incorporation of shipping firms in OFCs may have information asymmetry implications. Given that information asymmetry is related to agency costs, it is critical to assess the reasons for incorporation in an OFC, especially if these reasons do not regard pure tax haven incentives but also financial secrecy. The results of the thesis imply that certain combinations of the OFC characteristics may have different implications for earnings management and in turn, information asymmetry.

References

Abrahamsson, B. J. (2019). International Ocean Shipping: Current Concepts and Principles: Routledge.

Ahrends, M., Drobetz, W., & Nomikos, N. K. (2018). Corporate Cash Holdings in the Shipping Industry. Transportation Research Part E: Logistics and Transportation Review, 112, 107-124.

Alciatore, M., Easton, P., & Spear, N. (2000). Accounting for the Impairment of Long-lived Assets: Evidence from the Petroleum Industry. Journal of Accounting and Economics, 29(2), 151-172.

Alexandridis, G., Antypas, N., Gulnur, A., & Visvikis, I. (2020). Corporate Financial Leverage and M&As Choices: Evidence from the Shipping Industry. Transportation Research Part E: Logistics and Transportation Review, 133, 101828.

Alexandridis, G., Kavussanos, M. G., Kim, C. Y., Tsouknidis, D. A., & Visvikis, I. D. (2018). A Survey of Shipping Finance Research: Setting the Future Research Agenda. Transportation Research Part E: Logistics and Transportation Review, 115, 164-212.

Alexandridis, G., Sahoo, S., & Visvikis, I. (2017). Economic Information Transmissions and Liquidity Between Shipping Markets: New Evidence from Freight Derivatives. Transportation Research Part E: Logistics and Transportation Review, 98, 82-104.

Alexandrou, G., Gounopoulos, D., & Thomas, H. M. (2014). Mergers and Acquisitions in Shipping. Transportation Research Part E: Logistics and Transportation Review, 61, 212-234.

Andreou, P. C., Louca, C., & Panayides, P. M. (2014). Corporate Governance, Financial Management Decisions and Firm Performance: Evidence from the Maritime Industry. Transportation Research Part E: Logistics and Transportation Review, 63, 59-78.

Andrikopoulos, A., Merika, A. A., Triantafyllou, A., & Merikas, A. G. (2013). Internet Disclosure and Corporate Performance: A Case Study of the International Shipping Industry. Transportation Research Part A: Policy and Practice, 47, 141-152.

Arens, A., Elder, R., Beasley, M., & Hogan, C. (2017). Auditing and Assurance Services: Pearson.

Armstrong, C. S., Barth, M. E., Jagolinzer, A. D., & Riedl, E. J. (2010). Market Reaction to the Adoption of IFRS in Europe. The Accounting Review, 85(1), 31-61.

ASBJ (2018). Tentative Practical Solution on the Accounting for Virtual Currencies under the Payment Services Act (PITF38). In ASBJ (Ed.).

Ball, R., & Shivakumar, L. (2005). Earnings Quality in UK Private Firms: Comparative Loss Recognition Timeliness. Journal of Accounting and Economics, 39(1), 83-128.

Barth, M. E., Landsman, W. R., & Lang, M. H. (2008). International Accounting Standards and Accounting Quality. Journal of Accounting Research, 46(3), 467-498.

Bayar, O., Huseynov, F., & Sardarli, S. (2017). Corporate Governance, Tax Avoidance, and Financial Constraints. Financial Management, 47(3), 651-677.

Ben Amar, W., He, L., Li, T., & Magnan, M. (2019). The Corrosive Effect of Offshore Financial Centers on Multinational Firms' Disclosure Strategy. European Accounting Review, 28(3), 483-512.

Boonlert-U-Thai, K., Meek, G. K., & Nabar, S. (2006). Earnings Attributes and Investor-Protection: International Evidence. The International Journal of Accounting, 41(4), 327-357.

Brodie, P. (2015). Commercial Shipping Handbook: Informa Law from Routledge.

Chen, C. J. P., Ding, Y., & Xu, B. (2014). Convergence of Accounting Standards and Foreign Direct Investment. The International Journal of Accounting, 49(1), 53-86.

Chen, S., Wang, Y., & Zhao, Z. (2009). Regulatory Incentives for Earnings Management Through Asset Impairment Reversals in China. Journal of Accounting, Auditing & Finance, 24(4), 589-620.

Chen, T. T. Y., Zhang, F., & Zhou, G. (2017). Secrecy Culture and Audit Opinion: Some International Evidence. Journal of International Financial Management & Accounting, 28(3), 274-307.

Chowdhury, H., Rahman, S., & Sankaran, H. (2019). Leverage Deviation from the Target Debt Ratio and Leasing. Available at SSRN 2825322.

Col, B., & Patel, S. (2019). Going to Haven? Corporate Social Responsibility and Tax Avoidance. Journal of Business Ethics, 154(4), 1033-1050.

Corsi, T. M., & Scheraga, C. A. (1989). Pre-and Postderegulation Financial Strategies and Linkages to Performance in the Motor Carrier Industry: An Application of Canonical Scores. Transportation Research Part A: General, 23(2), 161-171.

Crosby, M., Pattanayak, P., Verma, S., & Kalyanaraman, V. (2016). Blockchain Technology: Beyond Bitcoin. Applied Innovation, 2, 6-10.

Czachorowski, K., Solesvik, M., & Kondratenko, Y. (2019). The Application of Blockchain Technology in the Maritime Industry. In Green IT Engineering: Social, Business and Industrial Applications (pp. 561-577): Springer.

Daske, H., Hail, L., Leuz, C., & Verdi, R. (2008). Mandatory IFRS Reporting Around the World: Early Evidence on the Economic Consequences. Journal of Accounting Research, 46(5), 1085-1142.

Dechow, P., Sloan, R., & Sweeney, A. (1995). Detecting Earnings Management. Accounting Review, 70(2), 193-225.

Desai, M. A., Foley, C. F., & Hines Jr, J. R. (2006). The Demand for Tax Haven Operations. Journal of Public Economics, 90(3), 513-531.

Dharmapala, D., & Hines Jr, J. R. (2009). Which Countries Become Tax Havens? Journal of Public Economics, 93(9-10), 1058-1068.

Drobetz, W., Gounopoulos, D., Merika, A., & Merikas, A. (2017). Determinants of Management Earnings Forecasts: The Case of Global Shipping IPOs. European Financial Management, 23(5), 975-1015.

Drobetz, W., Gounopoulos, D., Merikas, A., & Schroder, H. (2013). Capital Structure Decisions of Globally-Listed Shipping Companies. Transportation Research Part E: Logistics and Transportation Review, 52, 49-76.

Drobetz, W., Merikas, A., Merika, A., & Tsionas, M. G. (2014). Corporate Social Responsibility Disclosure: The Case of International Shipping. Transportation Research Part E: Logistics and Transportation Review, 71, 18-44.

Durnev, A., Li, T., & Magnan, M. (2016). Are Offshore Firms Worth More? Journal of Corporate Finance, 36, 131-156.

Durnev, A., Li, T., & Magnan, M. (2017). Beyond Tax Avoidance: Offshore Firms' Institutional Environment and Financial Reporting Quality. Journal of Business Finance & Accounting, 44(5-6), 646-696.

Duru, O., Mileski, J. P., & Gunes, E. (2017). Performance Obligations for "Revenue from Contracts with Customers" Principle in the Shipping Industry. Maritime Business Review.

Dwyer, G. P. (2015). The Economics of Bitcoin and Similar Private Digital Currencies. Journal of Financial Stability, 17, 81-91.

Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2012). Where do Firms Manage Earnings? Review of Accounting Studies, 17(3), 649-687.

Dyreng, S. D., Lindsey, B. P., & Thornock, J. R. (2013). Exploring the Role Delaware Plays as a Domestic Tax Haven. Journal of Financial Economics, 108(3), 751-772.

Filip, A., & Raffournier, B. (2014). Financial Crisis and Earnings Management: The European Evidence. The International Journal of Accounting, 49(4), 455-478.

Ford, J. H., & Wilcox, C. (2019). Shedding Light on the Dark Side of Maritime Trade - A new Approach for Identifying Countries as Flags of Convenience. Marine Policy, 99, 298-303.

Ghicas, D., Papadaki, A., Siougle, A., Demoirakos, E., & Tzovas, C. (2016). Financial Accouting (in Greek): Mpenos Publications.

Gordon, E. A., & Hsu, H.-T. (2018). Tangible Long-Lived Asset Impairments and Future Operating Cash Flows under US GAAP and IFRS. The Accounting Review, 93(1), 187-211.

Grammenos, C. T., Alizadeh, A. H., & Papapostolou, N. C. (2007). Factors Affecting the Dynamics of Yield Premia on Shipping Seasoned High Yield Bonds. Transportation Research Part E: Logistics and Transportation Review, 43(5), 549-564.

Grammenos, C. T., & Papapostolou, N. C. (2012). US Shipping Initial Public Offerings: Do Prospectus and Market Information Matter? Transportation Research Part E: Logistics and Transportation Review, 48(1), 276-295.

Hanlon, M. (2005). The Persistence and Pricing of Earnings, Accruals, and Cash Flows when Firms have Large Book-Tax Differences. The Accounting Review, 80(1), 137-166.

Hillenius, P., & Sandevarn, A. (2018). Shipbroking and Chartering Practice: Taylor & Francis.

Hong, P. K., Paik, D. G., & Smith, J. V. D. L. (2018). A Study of Long-Lived Asset Impairment under US GAAP and IFRS within the US Institutional

Environment. Journal of International Accounting, Auditing and Taxation, 31, 74-89.

Horton, J., Serafeim, G., & Serafeim, I. (2013). Does Mandatory IFRS Adoption Improve the Information Environment? Contemporary accounting research, 30(1), 388-423.

Houqe, M. N., Monem, R. M., Tareq, M., & Van Zijl, T. (2016). Secrecy and the Impact of Mandatory IFRS Adoption on Earnings Quality in Europe. Pacific-Basin Finance Journal, 40, 476-490.

Houqe, M. N., van Zijl, T., Dunstan, K., & Karim, A. W. (2012). The Effect of IFRS Adoption and Investor Protection on Earnings Quality Around the World. The International Journal of Accounting, 47(3), 333-355.

Hutton, A. P., Marcus, A. J., & Tehranian, H. (2009). Opaque Financial Reports, R2, and Crash Risk. Journal of Financial Economics, 94(1), 67-86.

IAASB (2009). ISA 200: Objective and General Principles Governing an Audit of Financial Statements. International Auditing and Assurance Standards Board New York, NY.

IAASB (2013). ISA 610: Using the Work of Internal Auditors. International Auditing and Assurance Standards Board New York, NY.

Iatridis, G. (2010). International Financial Reporting Standards and the Quality of Financial Statement Information. International Review of Financial Analysis, 19(3), 193-204.

Isidro, H., & Raonic, I. (2012). Firm Incentives, Institutional Complexity and the Quality of "Harmonized" Accounting Numbers. The International Journal of Accounting, 47(4), 407-436.

Jansson, J. (2012). Liner Shipping Economics: Springer Science & Business Media.

Jeanjean, T., & Stolowy, H. (2008). Do Accounting Standards Matter? An Exploratory Analysis of Earnings Management Before and After IFRS Adoption. Journal of Accounting and Public Policy, 27(6), 480-494.

Jones, J. (1991). Earnings Management During Import Relief Investigations. Journal of Accounting Research, 29, 193-228.

Kalouptsidi, M. (2014). Time to Build and Fluctuations in Bulk Shipping. American Economic Review, 104(2), 564-608.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2005). Governance Matters IV: Governance Indicators for 1996-2004: The World Bank.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The Worldwide Governance Indicators: Methodology and Analytical Issues. Hague Journal on the Rule of Law, 3(2), 220-246.

Kim, J.-B., & Li, T. M. (2018). Are Offshore Firms Less Conservative in Financial Reporting? International Evidence. Journal of International Financial Management & Accounting, 29(2), 131-165.

Kim, J.-B., Li, Y., & Zhang, L. (2011). Corporate Tax Avoidance and Stock Price Crash Risk: Firm-Level Analysis. Journal of Financial Economics, 100(3), 639-662.

KPMG (2012). Impact of IFRS:Shipping. KPMG.

Krishnan, G. V., & Zhang, J. (2019). Does Mandatory Adoption of IFRS Enhance Earnings Quality? Evidence from Closer to Home. The International Journal of Accounting, 54(01), 1-42.

Lantto, A. M., & SahlstrΓ¶m, P. (2009). Impact of International Financial Reporting Standard Adoption on Key Financial Ratios. Accounting & Finance, 49(2), 341-361.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings Management and Investor Protection: An International Comparison. Journal of Financial Economics, 69(3), 505-527.

Lewis, R., & Pendrill, D. (2000). Advanced Financial Accounting: FT Prentice Hall.

Lin, L. (2020). Collateral and the Choice between Bank Debt and Public Debt. Management Science, 62(1), 111-127.

Liu, Y., & Tsyvinski, A. (2018). Risks and Returns of Cryptocurrency. National Bureau of Economic Research.

Loh, A. L. C., & Tan, T. H. (2002). Asset Write - Offs - Managerial Incentives and Macroeconomic Factors. Abacus, 38(1), 134-151.

Ma, F., Liang, C., Ma, Y., & Wahab, M. I. M. (2020). Cryptocurrency Volatility Forecasting: A Markov Regime-Switching MIDAS Approach. Journal of Forecasting, https://doi.org/10.1002/for.2691, 1-14.

Margaritis, D., & Psillaki, M. (2010). Capital Structure, Equity Ownership and Firm Performance. Journal of Banking & Finance, 34(3), 621-632.

Marian, O. Y. (2013). Are Cryptocurrencies Super Tax Havens? 112 Michigan Law Review First Impressions, 38 (Available at SSRN: https://ssrn.com/abstract=2305863).

Marra, A., Mazzola, P., & Prencipe, A. (2011). Board Monitoring and Earnings Management Pre-and Post-IFRS. The International Journal of Accounting, 46(2), 205-230.

Merika, A., Theodoropoulou, S., Triantafyllou, A., & Laios, A. (2015). The Relationship between Business Cycles and Capital Structure Choice: The Case of the International Shipping Industry. The Journal of Economic Asymmetries, 12(2), 92-99.

Merikas, A., Gounopoulos, D., & Nounis, C. (2009). Global Shipping IPOs Performance. Maritime Policy & Management, 36(6), 481-505.

Messier, W., Glover, S., & Prawitt, D. (2017). Auditing & Assurance Services: A Systematic Approach: McGraw Hill.

Nagy, A. L., & Cenker, W. J. (2002). An Assessment of the Newly Defined Internal Audit Function. Managerial Auditing Journal.

Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System. Bitcoin.org.

Nam, H. J., & An, Y. H. (2017). Default Risk and Firm Value of Shipping & Logistics Firms in Korea. The Asian Journal of Shipping and Logistics, 33(2), 61-65.

Needles, B. E., Powers, M., & Crosson, S. V. (2013). Principles of Accounting: Cengage Learning.

Negkakis, C. (2016). Corporate Accounting in Accordance with the Greek and International Accounting Standards: Sustainable Accounting Publications.

Negkakis, C. (2015b). International Financial Reporting Standards Special Issues: Sustainable Accounting Publications.

Negkakis, C. (2015a). International Financial Reporting Standards Theory and Applications: Sustainable Accounting Publications.

Negkakis, C., & Tachinakis, P. (2017). Auditing Internal Audit Theory and Applications (in Greek): Sustainable Accounting Publications.

OECD (2002). The OECD List of Unco-operative Tax Havens – A Statement by the Chair of the OECD's Committee on Fiscal Affairs. Paris: OECD.

Panayides, P. M., Lambertides, N., & Cullinane, K. (2013). Liquidity Risk Premium and Asset Pricing in US Water Transportation. Transportation Research Part E: Logistics and Transportation Review, 52, 3-15.

Panayides, P. M., Lambertides, N., & Savva, C. S. (2011). The Relative Efficiency of Shipping Companies. Transportation Research Part E: Logistics and Transportation Review, 47(5), 681-694.

Parviainen, T., Lehikoinen, A., Kuikka, S., & Haapasaari, P. (2018). How Can Stakeholders Promote Environmental and Social Responsibility in the Shipping Industry? WMU Journal of Maritime Affairs, 17(1), 49-70.

Penner, J., Kreuze, J., & Langsam, S. (2013). Long-Lived Asset Impairments in the Shipping Industry and the Impact on Financial Statement Ratios: Comparing US GAAP and IFRS Standards. International Journal of Accounting and Financial Reporting, 3(2), 76.

Picard, P. M., & Pieretti, P. (2011). Bank Secrecy, Illicit Money and Offshore Financial Centers. Journal of Public Economics, 95(7-8), 942-955.

Plassaras, N. A. (2013). Regulating Digital Currencies: Bringing Bitcoin within the Reach of IMF. Chicago Journal of International Law, 14, 377.

Plomaritou, E., & Menelaou, A. (2020). Charter Market Segmentation in Response to Trade's Needs. Journal of Economics, Management and Trade, 78-87.

Plomaritou, E., & Papadopoulos, A. (2017). Shipbroking and Chartering Practice: Taylor & Francis.

Power, V. (2018). EU Shipping Law: Informa Law from Routledge.

Protopsaltis, N. (2008). Special Issues of Shipping Firm's Accounting (in Greek): IESOEL.

Protopsaltis, N., & Sarikostidis, S. (2003). Audit of Shipping Companies (in Greek). Athens: Stamoulis.

PWC (2016). IFRS 16, Leases: Implications for the Shipping Industry. PWC.

Rampini, A. A., & Viswanathan, S. (2013). Collateral and Capital Structure. Journal of Financial Economics, 109(2), 466-492.

Riedl, E. J. (2004). An Examination of Long-lived Asset Impairments. The Accounting Review, 79(3), 823-852.

Roosenboom, P., van der Goot, T., & Mertens, G. (2003). Earnings Management and Initial Public Offerings: Evidence from the Netherlands. The International Journal of Accounting, 38(3), 243-266.

Roychowdhury, S. (2006). Earnings Management Through Real Activities Manipulation. Journal of Accounting and Economics, 42(3), 335-370.

Schjelderup, G. (2016). Secrecy Jurisdictions. International Tax and Public Finance, 23(1), 168-189.

Schofield, J. (2013). Laytime and Demurrage: Taylor & Francis.

Stalhane, M., Andersson, H., Christiansen, M., & Fagerholt, K. (2014). Vendor Managed Inventory in Tramp Shipping. Omega, 47, 60-72.

Tsionas, M. G., Merikas, A. G., & Merika, A. A. (2012). Concentrated Ownership and Corporate Performance Revisited: The Case of Shipping. Transportation Research Part E: Logistics and Transportation Review, 48(4), 843-852.

UNCTAD (2019). Review of Maritime Transport 2019: United Nations Publications.

Urquhart, A. (2016). The Inefficiency of Bitcoin. Economics Letters, 148, 80-82.

Van Tendeloo, B., & Vanstraelen, A. (2005). Earnings Management Under German GAAP Versus IFRS. European Accounting Review, 14(1), 155-180.

Venter, H. (2018). Digital Currency: A Case for Standard Setting Activity. ASAF meeting, 1-24.

Vogt, S. D. (2017). The Digital Underworld: Combating Crime on the Dark Web in the Modern Era. Santa Clara Journal of International Law, 15, 104.

Walther, T., Klein, T., & Bouri, E. (2019). Exogenous Drivers of Bitcoin and Cryptocurrency Volatility-A Mixed Data Sampling Approach to Forecasting. Journal of International Financial Markets, Institutions and Money, 63, 101133.

Wang, G. W. Y., Yang, Z., Zhang, D., Huang, A., & Yang, Z. (2017). Application of Bayesian Networks in Analysing Tanker Shipping Bankruptcy Risks. Maritime Business Review, 2-3, 177-198.

Yeo, H. (2016). Solvency and Liquidity in Shipping Companies. The Asian Journal of Shipping and Logistics, 32(4), 235-241.

Yi, S., Xu, Z., & Wang, G.-J. (2018). Volatility Connectedness in the Cryptocurrency Market: Is Bitcoin a Dominant Cryptocurrency? International Review of Financial Analysis, 60, 98-114.

Zhang, R., Lu, Z., & Ye, K. (2010). How Do Firms React to the Prohibition of Long-lived Asset Impairment Reversals? Evidence From China. Journal of Accounting and Public Policy, 29(5), 424-438.

Zucca, L. J., & Campbell, D. R. (1992). A Closer Look at Discretionary Write downs of Impaired Assets. Accounting Horizons, 6(3), 30.